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Access DB# 88X4

## SEARCH REQUEST FORM

### Scientific and Technical Information Center

Requester's Full Name: Dick Examiner #: 67352 Date: 3/11/03  
 Art Unit: 1711 Phone Number 305-2237 Serial Number: 10/023774  
 Mail Box and Bldg/Room Location: 314D Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, key words, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Toroids of claim (1) tanks

***** STAFF USE ONLY		Type of Search	Vendors and cost where applicable
Searcher	<u>EJ</u>	NA Sequence (#)	STN <u>\$ 357.96</u>
Searcher Phone #	_____	AA Sequence (#)	Dialog <u>(6)(subsets)</u>
Searcher Location	_____	Structure (#)	Questel/Orbit <u>(6)</u>
Date Searcher Picked Up	_____	Bibliographic	DeLink <u>(and)</u>
Date Completed	<u>3-13-03</u>	Litigation	Lexis/Nexis <u>(and)</u>
Searcher Prep & Review Time	<u>5</u>	Fulltext	Sequence Systems <u>(and)</u>
Clerical Prep Time	_____	Patent Family	WWW/Internet <u>(and)</u>
Online Time	<u>50</u>	Other	Other (specify) _____

copolymers with bithiophene)

L43 ANSWER 11 OF 15 ZCA COPYRIGHT 2003 ACS

131:88268 Synthesis and electrochemical characterization of a new polymer constituted of alternating carbazole and oxadiazole moieties. Meng, Hong; Chen, Zhi-Kuan; Yu, Wang-Lin; Pei, Jian; Liu, Xiao-Ling; Lai, Yee-Hing; Huang, Wei (Institute of Materials Research and Engineering (IMRE), National University of Singapore, Singapore, Singapore). Synthetic Metals, 100(3), 297-301 (English) 1999. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB The synthesis and electrochem. characterization are described of a copolymer contg. an electron rich carbazole moiety and an electron deficient oxadiazole unit, poly[N-(2'-ethylhexyl)-carbazole-3,6-diyl-1'',3'',4'',5''-oxadiazole-2'',5''-diyl] (PCO). PCO is sol. in THF, CHCl<sub>3</sub>, xylene, and DMSO. The structure of the polymer is confirmed by FTIR, NMR, and elemental anal. The optical and electronic properties of the polymer were studied by UV-Vis absorption spectroscopy and photoluminescence spectroscopy and cyclic voltammetry. The PCO films emit greenish-blue light (.lambda.max 485 nm) upon UV excitation. Both p-doping and n-doping processes were obsd. by cyclic voltammetry. A comparison between the properties of polycarbazole and polycarbazole-oxadiazole is presented.

IT 229626-81-7P 229626-82-8P

(prepn. and electronic structure and blue light emission by poly(carbazole-oxadiazole) conjugated polymer)

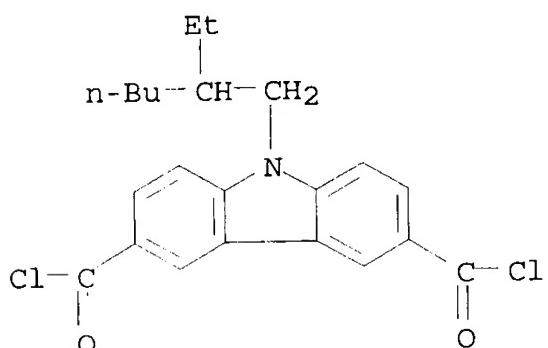
RN 229626-81-7 ZCA

CN 9H-Carbazole-3,6-dicarbonyl dichloride, 9-(2-ethylhexyl)-, polymer with hydrazine (9CI) (CA INDEX NAME)

CM 1

CRN 229626-80-6

CMF C22 H23 Cl2 N O2

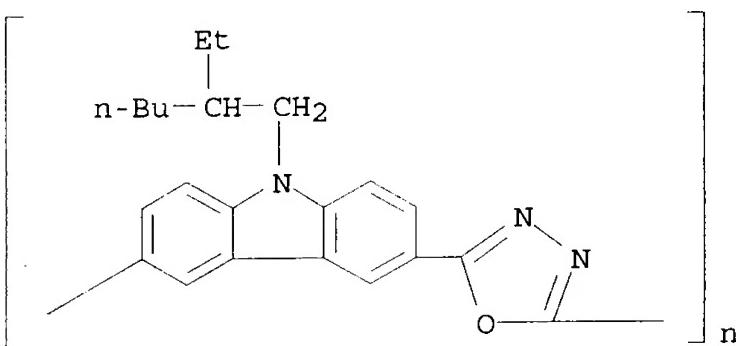


CM 2

CRN 302-01-2  
 CMF H4 N2

H<sub>2</sub>N- NH<sub>2</sub>

RN 229626-82-8 ZCA  
 CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]-1,3,4-oxadiazole-2,5-diyl] (9CI) (CA INDEX NAME)



- CC 35-7 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 74
- ST polycarbazole oxadiazole prep electronic structure  
 photoexcitation; conjugated polycarbazole  
 oxadiazole blue light emission
- IT Luminescence  
 (blue light; prep. and electronic structure and blue light  
 emission by poly(carbazole-oxadiazole)  
 conjugated polymer)
- IT Polymers, preparation  
 (conjugated; prep. and electronic structure and blue  
 light emission by poly(carbazole-oxadiazole)  
 conjugated polymer)
- IT Polymers, preparation  
 (polycarbazoles, oxadiazole contg.; prep. and  
 electronic structure and blue light emission by poly(  
 carbazole-oxadiazole) conjugated  
 polymer)
- IT Electron configuration  
 Optical absorption  
 Photoexcitation  
 (prep. and electronic structure and blue light emission by  
 poly(carbazole-oxadiazole) conjugated  
 polymer)
- IT 187148-77-2P, N-(2-Ethylhexyl)carbazole 229626-78-2P,  
 3,6-Bis(N,N-dimethylcarbamoyl)-9-(2-ethylhexyl)carbazole  
 229626-79-3P, N-(2-Ethylhexyl)carbazole-3,6-dicarboxylic acid  
 (intermediate; prep. and electronic structure and blue light

- emission by poly(carbazole-oxadiazole)  
conjugated polymer)
- IT 229626-80-6P, N-(2-Ethylhexyl)carbazole-3,6-dicarbonyl chloride  
(monomer; prepn. and electronic structure and blue light emission  
by poly(carbazole-oxadiazole)  
conjugated polymer)
- IT 229626-81-7P 229626-82-8P  
(prepn. and electronic structure and blue light emission by  
poly(carbazole-oxadiazole) conjugated  
polymer)
- IT 79-44-7, n,N-Dimethylcarbamoyl chloride 86-74-8, 9H-Carbazole  
7647-01-0, Hydrochloric acid, reactions 7719-09-7, Thionyl  
chloride 18908-66-2, 2-Ethylhexylbromide  
(prepn. and electronic structure and blue light emission by  
poly(carbazole-oxadiazole) conjugated  
polymer)

L43 ANSWER 12 OF 15 ZCA COPYRIGHT 2003 ACS

130:237945 Synthesis and electrochemical polymerization of Ter-arenes based on N-ethylcarbazole and thiophene. Sezer, Esma; Van Hooren, Marc; Sarac, A. Sezai; Hallensleben, Manfred L. (Department of Chemistry, Istanbul Technical University, Istanbul, 80626, Turk.). Journal of Polymer Science, Part A: Polymer Chemistry, 37(4), 379-381 (English) 1999. CODEN: JPACEC. ISSN: 0887-624X.

Publisher: John Wiley & Sons, Inc..

AB Bis(thienyl) compds. based on N-ethylcarbazole and thiophene were prep'd. to obtain extensively conjugated, low oxidn. potential monomers and the corresponding conjugated conducting polymers with properties of polythiophenes and polycarbazoles. The 3,6-bis(2-thiophenyl)-9-ethylcarbazole (BTECZ) monomer was prep'd. via Grignard coupling of thiophene and bromoethylcarbazole using (bisdiphenylphosphino)propane nickel(II) chloride as catalyst. The cyclic voltammogram of BTECZ reveals irreversible oxidn. at about 0.849 V vs. Fc/Fc+, which is much lower than that of thiophene or ethylcarbazole, and polymn. occurs in a fast reaction after initial electron transfer. Upon repeated cycles, a new redox process develops at 0.25 V, with concurrent current response increase indicative of deposition of polymer on the electrode surface. The electrochem. polymn. reaction likely occurs through the 2-position on the thiophene ring as indicated by the appearance of only one oxidn. wave.

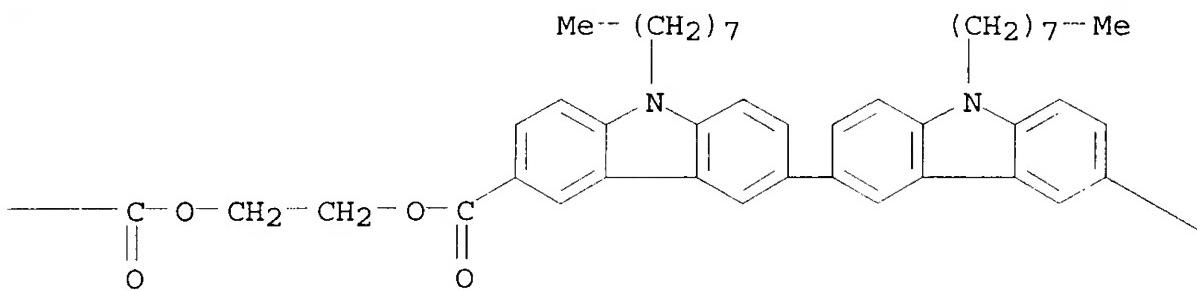
IT 221316-96-7P, 3,6-Bis(2-thiophenyl)-9-ethylcarbazole homopolymer  
(prepn. of low oxidn. potential monomer and electrochem. polymn.  
to obtain poly(N-Et carbazole-bithiophene) conducting polymers)

RN 221316-96-7 ZCA  
CN 9H-Carbazole, 9-ethyl-3,6-di-2-thienyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 215502-69-5

PAGE 1-A



PAGE 1 - B

1

IT 210344-74-4P

(prepn. and electrochem. and electroluminescence properties of  
bicarbazole-contg. polyesters)

L44 ANSWER 16 OF 27 ZCA COPYRIGHT 2003 ACS

126:212647 Polyarylenes on the basis of alkylpyrrole and alkylcarbazole derivatives and their oligomeric model systems. Geissler, Uwe; Hallensleben, Manfred L.; Rienecker, Anke; Rohde, Nils (School of Natural and Environmental Sciences, Coventry University, Coventry, CV1 5FB, UK). Polymers for Advanced Technologies, 8(2), 87-92 (English) 1997. CODEN: PADTE5. ISSN: 1042-7147. Publisher: Wiley.

AB The redox and spectroscopic properties of sol. poly(9-decylcarbazole) derivs. and poly(1-decylpyrrole) were studied. The polymers were synthesized via the Yamamoto polycondensation method. Analyzing the electrochem. and optical properties of 3,6-linked poly(alkylcarbazole)s it is evident that the conjugation segment is the benzidine system and the overall properties of these polymers can be compared with meta linked poly(phenylene)s. In opposite, 2,7-linked poly(alkylcarbazole)s reveal an even longer conjugation segment comparable with para linked poly(phenylene)s. First observations in the case of poly(1-decylpyrrole) suggest a higher steric hindrance compared to poly(1-methylpyrrole). Mol. modeling

studies confirm this.

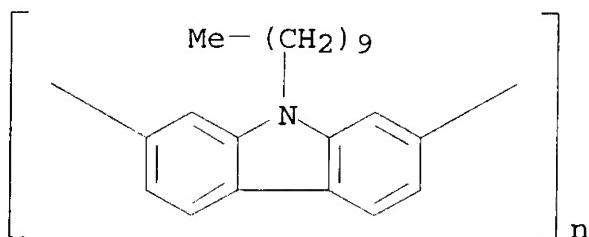
IT 188706-51-6, Poly(1-decyl-9H-carbazole-2,7-diyl)

188738-54-7, Poly(9-decyl-9H-carbazole-3,6-diyl)

(cyclic voltammetry and Raman spectroscopy of polyarylenes on basis of alkylpyrrole and alkylcarbazole derivs. and oligomeric model systems)

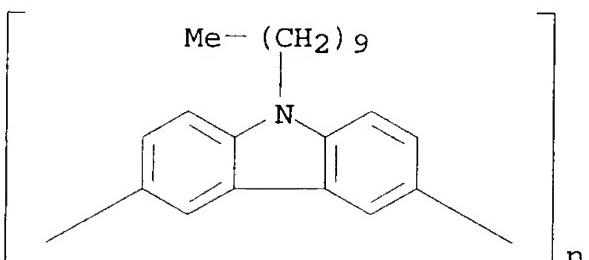
RN 188706-51-6 ZCA

CN Poly(1-decyl-9H-carbazole-2,7-diyl) (9CI) (CA INDEX NAME)



RN 188738-54-7 ZCA

CN Poly(9-decyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



IT 188706-51-6, Poly(1-decyl-9H-carbazole-2,7-diyl)

188738-54-7, Poly(9-decyl-9H-carbazole-3,6-diyl)

(cyclic voltammetry and Raman spectroscopy of polyarylenes on basis of alkylpyrrole and alkylcarbazole derivs. and oligomeric model systems)

L44 ANSWER 17 OF 27 ZCA COPYRIGHT 2003 ACS

125:59318 Preparation of soluble and fluorescent poly(arylene)s by 1,3-dipolar polycycloaddition and properties of the polymers.

Kanbara, Takaki; Ishii, Takumi; Hasegawa, Kiyoshi; Yamamoto, Takakazu (Dep. Chemical and Biochem. Eng., Toyama Univ., Toyama, 930, Japan). Polymer Bulletin (Berlin), 36(6), 673-679 (English) 1996. CODEN: POBUDR. ISSN: 0170-0839. Publisher: Springer.

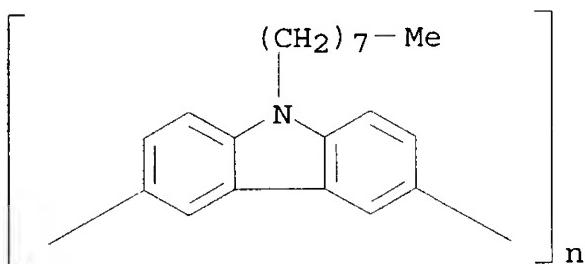
AB 1,3-Dipolar polycycloaddns. of 2,3,5,6-tetramethylterephthalodinitri le oxide with 3,6-diethynyl-9-hexylcarbazole or 2,6-diethynylpyridine afforded novel sol. polyisoxazole poly(arylene)s. The polymers showed strong fluorescence in solns. as well as in cast films with peaks at 340-490 nm.

IT 178278-40-5P

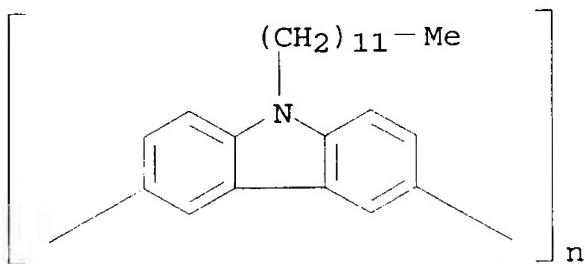
(prepn. of sol. polyisoxazoles by 1,3-dipolar polycycloaddn. of

contg. arom. azo residue)

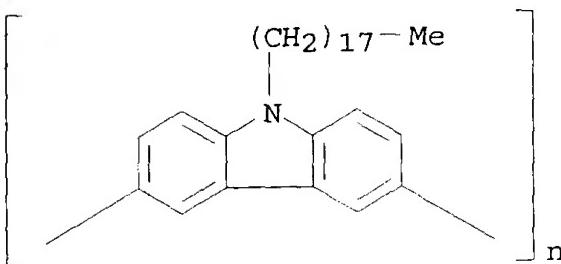
- L44 ANSWER 19 OF 27 ZCA COPYRIGHT 2003 ACS  
 119:250891 Thermal transitions in poly (N-alkyl-3,6-carbazolylenes).  
 Siove, A.; Belorgey, G. (Lab. Rech. Macromol., Univ. Paris-Nord,  
 Villejuif, F-93430, Fr.). Polymer Bulletin (Berlin, Germany),  
 31(1), 105-110 (English) 1993. CODEN: POBUDR. ISSN: 0170-0839.
- AB Thermal transitions of poly(N-alkyl-3,6-carbazolylenes) were analyzed by DSC. Glass transition temps. of the polymers decreased by increasing side-chain length. As-prepd. polymers bearing n-octyl pendent groups exhibit crystallinity but no crystn. from the melt was obsd. Recrystn. of the samples thermally treated was obtained by solvent treatment. Crystallinity was assocd. to an ordered phase involving the main-chain units.
- IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 151173-03-4, Poly(9-dodecyl-9H-carbazole-3,6-diyl)  
 151173-04-5, Poly(9-octadecyl-9H-carbazole-3,6-diyl)  
 (thermal transitions in)
- RN 121624-04-2 ZCA  
 CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



- RN 151173-03-4 ZCA  
 CN Poly(9-dodecyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



- RN 151173-04-5 ZCA  
 CN Poly(9-octadecyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



- IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 151173-03-4, Poly(9-dodecyl-9H-carbazole-3,6-diyl)  
 151173-04-5, Poly(9-octadecyl-9H-carbazole-3,6-diyl)  
 (thermal transitions in)

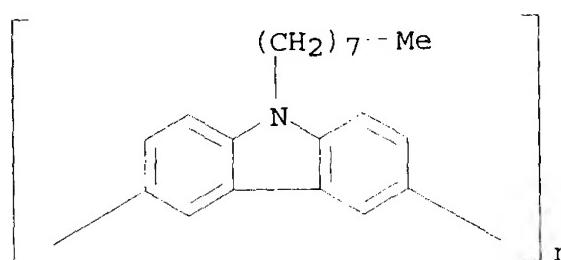
L44 ANSWER 20 OF 27 ZCA COPYRIGHT 2003 ACS

119:181323 Investigation of the electrocatalyzed step polymerization of soluble electroactive poly(N-alkyl-3,6-carbazolylenes). Faid, Karim; Siove, Alain; Ades, Dominique; Chevrot, Claude (Lab. Rech. Macromol., Univ. Paris-Nord, Villejuif, 93430, Fr.). Synthetic Metals, 55(2-3), 1656-61 (English) 1993. CODEN: SYMEDZ. ISSN: 0379-6779.

AB Simultaneous gel-phase chromatog. and cyclic voltammetry measurements are carried out in the course of the electrocatalyzed polymn. of 3,6-dibromo-N-alkylcarbazoles (alkyl = Bu, octyl). The evolution of the mol.-wt. distribution as a function of the electrolysis time reveals a step polymn. process, while showing a termination of the chain growth due to the occurrence of monobrominated species. The consumption of the Ni catalytic species corresponds in a first step to an increase in the chain length, while after given periods there is no more chain growth related to the continuous consumption of the catalytic precursor. The study of the effect of the initial [monomer]/[catalyst] ratio on the mol.-wt. distribution evolution indicates that the coupling of Ni(0)-activated species is responsible for the chain growth.

- IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 (prepn. of, by electrocatalyzed step polymn.)

RN 121624-04-2 ZCA  
 CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



- IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)

(prep. of, by electrocatalyzed step polymn.)

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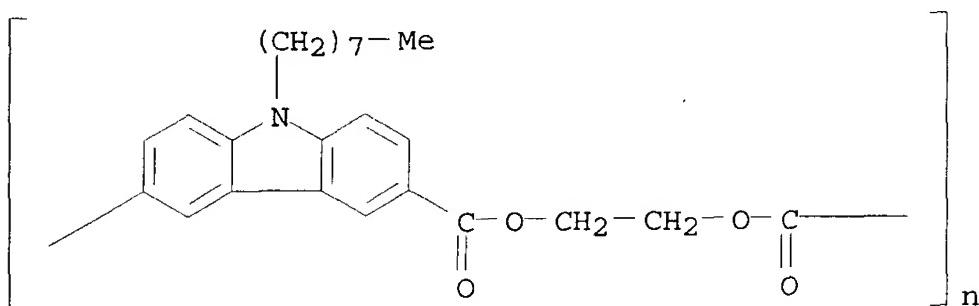
118:102721 Soluble polyesters containing carbazole units in the main chain: synthesis, properties and chemical doping. Drzewinski, Isabel; Ades, Dominique; Siove, Alain (Lab. Rech. Macromol., Univ. Paris-Nord, Villetaneuse, 93430, Fr.). Makromolekulare Chemie, Rapid Communications, 13(12), 549-54 (English) 1992. CODEN: MCRCD4. ISSN: 0173-2803.

AB N-Octylcarbazole-3,6-dicarboxylic acid is prep'd. and then polycondensed with ethylene glycol to form a polyester with carbazole groups in the main chain. The polyester is characterized. The polyester is then doped with I; elec. cond. is presented.

IT 145929-06-2P  
(prep. and characterization and elec. cond. of)

RN 145929-06-2 ZCA

CN Poly[(9-octyl-9H-carbazole-3,6-diyl)carbonyloxy-1,2-ethanediylloxycarbonyl] (9CI) (CA INDEX NAME)



IT 145929-06-2P  
(prep. and characterization and elec. cond. of)

L44 ANSWER 22 OF 27 ZCA COPYRIGHT 2003 ACS

114:31798 Chain length effect on the electroactivity of poly(N-alkyl-3,6-carbazolediyl) thin films. Siove, A.; Ades, D.; N'Gbilo, E.; Chevrot, C. (Lab. Rech. Macromol., Univ. Paris-Nord, Villetaneuse, 93430, Fr.). Synthetic Metals, 38(3), 331-40 (English) 1990. CODEN: SYMEDZ. ISSN: 0379-6779.

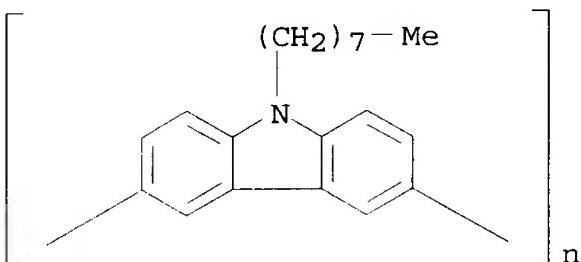
AB Several poly(N-alkyl-3,6-carbazolediyl)s (PCZS) have been obtained by electroredn. of the corresponding dibromomonomers in the presence of a catalytic Ni(0)-based system. Depending on the nature of the alkyl group linked to the nitrogen atom, PCZS are sol. in org. solvents such as nitrobenzene, chloroform and THF and insol. in acetonitrile and alcs. Taking these properties into account thin films have been prep'd. (in the neutral state) either by casting from solns. or directly by electrodeposition onto conducting substrates in the CH<sub>3</sub>CN/NBu<sub>4</sub>BF<sub>4</sub> medium. Electrochem. behavior of these materials in the range 0-1.4 V vs. SCE (SCE) is strongly dependent on the macromol. chain length, but is slightly affected by the nature of the alkyl chain. Depending on the potential applied, the

films are either colorless, green or blue. The redox processes involved in electrochem. oxidn. of the polymer as well as those of the oligomers are discussed.

IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)  
(redox reactions of, electrochem., in org. solvent)

RN 121624-04-2 ZCA

CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)

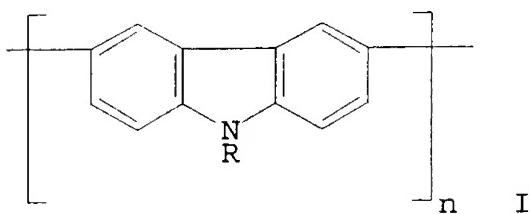


IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)  
(redox reactions of, electrochem., in org. solvent)

L44 ANSWER 23 OF 27 ZCA COPYRIGHT 2003 ACS

111:40172 Polymers of carbazole derivatives. Matsura, Akira; Okamoto, Akio (Denki Kagaku Kogyo K. K., Japan). Jpn. Kokai Tokkyo Koho JP 01011129 A2 19890113 Heisei, 7 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1987-166684 19870703.

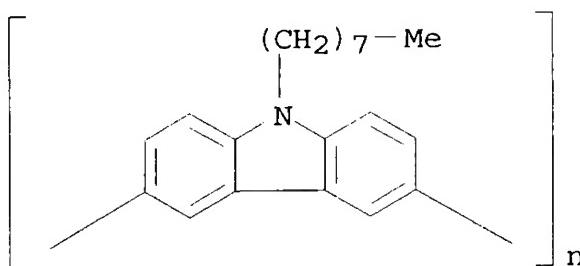
GI



AB Title polymers I [R = C<sub>2</sub>-15 alkyl, (cycloalkyl- or aryl-substituted) alkyl, C<sub>5</sub>-7 cycloalkyl; n = 2-500], useful for elec. conductive and photoconductive materials, are prep'd. Thus, 10 g 3,6-dibromocarbazole was added slowly to a suspension of 1.48 g 60% NaH in 50 mL DMF, stirred at room temp. for 30 min, treated dropwise with a soln. of 6.5 mL n-octyl bromide in 30 mL DMF, and stirred at 70.degree. for 10 h to give 9.98 g N-n-octyl-3,6-dibromocarbazole (II). The Grignard reagent from 0.55 g Mg and 9.98 g II was refluxed with 50 mg dichloro(2,2'-bipyridyl)nickel in THF for 15 h, the mixt. was added to concd. HCl, filtered, washed with H<sub>2</sub>O, and dried to give 3.98 g poly(N-n-octylcarbazole) which was dissolved in CHCl<sub>3</sub>, cast on a glass plate, and dried to give a film with elec. cond. 10-13 S/cm.

IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 (prepn. of, for elec. conductors and photoconductors)

RN 121624-04-2 ZCA  
 CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 (prepn. of, for elec. conductors and photoconductors)

L44 ANSWER 24 OF 27 ZCA COPYRIGHT 2003 ACS

95:151198 Polyamides containing a carbazole system in the main chain.  
 Domanski, Andrzej; Pielichowski, Jan (Inst. Chem. Technol. Org., Politech. Krakowskiej, Krakow, Pol.). Zeszyty Naukowe - Wyższa Szkoła Pedagogiczna im. Powstanców Śląskich w Opolu: Chemia, 4, 5-37 (Polish) 1981. CODEN: ZWSCDK. ISSN: 0324-9034.

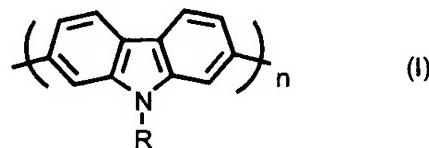
AB Nitration and redn. of carbazole [86-74-8] and its C2-16 9-alkyl derivs. gave the corresponding 3,6-diaminocarbazoles which were polycondensed with (HO<sub>2</sub>C)<sub>2</sub>(CH<sub>2</sub>)<sub>n</sub> (n = 0-8) and terephthalic acid. Acylation of 9-ethylcarbazole (I) [86-28-2] with AcCl [75-36-5] followed by bromoform reaction, and acylation of I with succinic anhydride [108-30-5] gave 9-ethylcarbazole-3,6-dicarboxylic acid [3215-45-0] and .gamma..gamma.'-[9-ethylcarbazole-3,6-diyl]bis[.gamma.-ketobutyric acid] [79067-33-7], resp., which, and their acid chloride derivs., were polycondensed with hexamethylenediamine. The polycondensations were performed in the melt, in soln., and interfacially. Melting temps., thermal stability, solv., and mech. and dielec. properties of the resulting polyamides (mol. wt. 1toreq. 11,200) were detd. as functions of their structure and preparative method.

IT 58130-97-5P 58130-98-6P 58130-99-7P  
 58131-00-3P 58131-11-6P 58131-12-7P  
 (prepn. and properties of)

RN 58130-97-5 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyil)imino] (9CI) (CA INDEX NAME)

WE CLAIM:

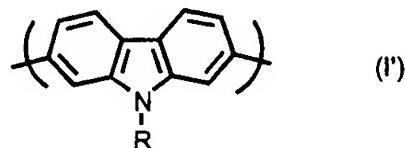
1. A conjugated poly(N-alkyl-2,7-carbazole) of formula (I):



wherein R represents a linear or branched alkyl group having 1 to 22 carbon atoms and n is an integer of about 3 to about 100.

2. A conjugated homopolymer selected from the group consisting of poly(N-octyl-2,7-carbazole) and poly(N-octadecane-2,7 carbazole).

3. A conjugated polymer comprising alternating units of formula (I'):



wherein R represents a linear or branched alkyl group having 1 to 22 carbon atoms.

4. A conjugated polymer selected from the group consisting of poly(N-octyl-2,7-carbazole-alt-9,9-dioctyl-2,7-fluorene), poly[N-2-ethylhexyl-2,7-carbazole-alt-5,5'-bithiophene)], poly (N-octyl-2,7-carbazole-*alt*-2,5-thiophene), poly (N-octyl-2,7-carbazole-*alt*-2,5-dioxyethylenethiophene), and poly (N-(2-ethylhexyl)-2,7-carbazole-*alt*-4-butyl-*N,N*-bis(*p*-phenyl)phenylamine).

5. A process for preparing a conjugated poly(N-alkyl-2,7-carbazole) of formula (I):

=> file reg  
FILE 'REGISTRY' ENTERED AT 17:04:14 ON 13 MAR 2003  
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L1 2153 S LECLERC ?/AU OR LE CLERC ?/AU  
L2 3727 S MORIN ?/AU  
L3 15 S L1 AND L2  
SEL L3 1-15 RN

FILE 'REGISTRY' ENTERED AT 16:08:23 ON 13 MAR 2003  
L4 126 S E1-E126

FILE 'LREGISTRY' ENTERED AT 16:09:11 ON 13 MAR 2003  
L5 STR  
L6 7 S L5  
L7 129 S 1839.22.20/RID

FILE 'REGISTRY' ENTERED AT 16:10:48 ON 13 MAR 2003  
L8 28040 S 1839.22.20/RID  
L9 50 S L4 AND L8  
L10 33 S L9 AND PMS/CI

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L11 STR L5

FILE 'REGISTRY' ENTERED AT 16:21:08 ON 13 MAR 2003  
L12 SCR 2043  
L13 45 S L11 AND L12  
L14 STR  
L15 24 S (L11 NOT L14) AND L12  
E POLYOTHER/PCT  
L16 208121 S E3  
E POLYAMINE/PCT  
L17 36499 S E3  
L18 33 S L10 AND (L16 OR L17)  
L19 545 S (L11 NOT L14) AND L12 FUL  
SAV L19 TRU774/A  
L20 29 S L19 AND L10  
L21 508 S L19 AND (L16 OR L17)  
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SAV L25 TRU774A/A  
L26 SCR 2068

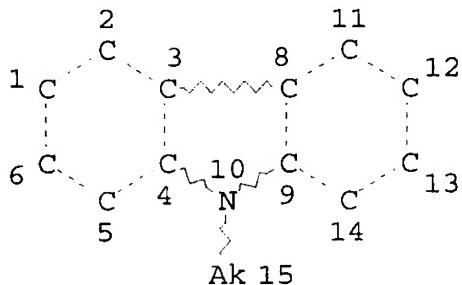
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 L29            54 S L25 AND L28

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 L32            108 S L28  
 L33            121 S L25  
 L34            250 S L22  
 L35            302 S L19  
 L36            6 S (CONJ# OR CONJUGAT?) (2A) (POLYCARBAZOLE# OR POLY(A) CARBA  
 L37            15502 S (CONJ# OR CONJUGAT?) (2A) (POLYM? OR COPOLYM? OR HOMOPOLY  
 L38            234 S POLYCARBAZOLE# OR POLY(A) CARBAZOLE#  
 L39            4 S (L32 OR L33 OR L34 OR L35) AND L36  
 L40            48 S (L32 OR L33 OR L34 OR L35) AND L37  
 L41            33 S (L32 OR L33 OR L34 OR L35) AND L38  
 L42            11 S L40 AND L41  
 L43            15 S L30 OR L39 OR L42  
 L44            27 S L31 NOT L43

FILE 'REGISTRY' ENTERED AT 17:04:14 ON 13 MAR 2003

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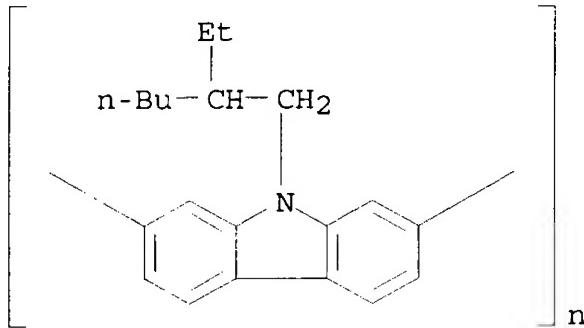
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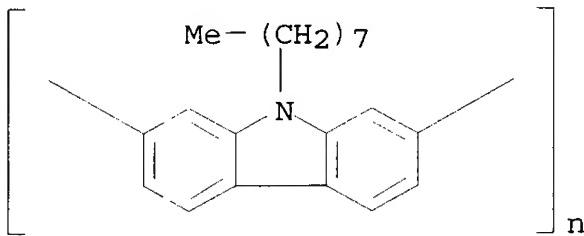
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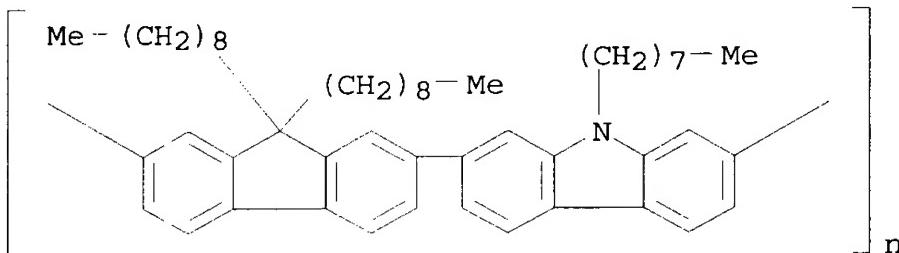
L43 ANSWER 1 OF 15 ZCA COPYRIGHT 2003 ACS  
138:98012 **Conjugated polycarbazole** derivatives in  
organic light emitting diodes. Leclerc, Mario; Morin,  
Jean-Francois; Levesque, Isabelle; D'iorio, Marie; Py, Christophe  
(Can.). U.S. Pat. Appl. Publ. US 2003008172 A1 20030109, 11 pp.  
(English). CODEN: USXXCO. APPLICATION: US 2001-828926 20010410.  
AB Org. light-emitting diodes (OLEDs) are described which employ active  
layers contg. conjugated poly(N-alkyl-2,7-carbazole) derivs. The  
active layers may comprise a blend of the poly(N-alkyl-2,7-  
carbazole) derivs. with other compds.  
IT 353276-27-4 444289-49-0, Poly(9-octyl-9H-carbazole-  
2,7-diyl) 482576-93-2  
(org. light-emitting diodes with active layers contg. alkyl  
carbazole polymer derivs.)  
RN 353276-27-4 ZCA  
CN Poly[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl] (9CI) (CA INDEX NAME)



RN 444289-49-0 ZCA  
 CN Poly(9-octyl-9H-carbazole-2,7-diyl) (9CI) (CA INDEX NAME)



RN 482576-93-2 ZCA  
 CN Poly[(9-octyl-9H-carbazole-2,7-diyl)(9,9-dinonyl-9H-fluorene-2,7-diyl)] (9CI) (CA INDEX NAME)



IC ICM H05B033-14  
 NCL 428690000; 428917000; 313504000; 313506000; 257040000; 257103000;  
 252301350  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 38, 76  
 IT 15082-28-7, 2-(4-Biphenylyl)-5-(4-tert-butylphenyl)-1,3,4-oxadiazole  
 65181-78-4, N,N'-Diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-  
 4,4'-diamine) 353276-27-4 444289-49-0,  
 Poly(9-octyl-9H-carbazole-2,7-diyl) 482576-93-2  
 (org. light-emitting diodes with active layers contg. alkyl  
 carbazole derivs.)

L43 ANSWER 2 OF 15 ZCA COPYRIGHT 2003 ACS

138:39644 Novel red electroluminescent polymers derived from carbazole and 4,7-bis(2-thienyl)-2,1,3-benzothiadiazole. Huang, Jian; Xu, Yishe; Hou, Qiong; Yang, Wei; Yuan, Ming; Cao, Yong (Institute of Polymer Optoelectronic Materials and Devices, South China University of Technology, Canton, 510640, Peop. Rep. China). Macromolecular Rapid Communications, 23(12), 709-712 (English) 2002. CODEN: MRCOE3. ISSN: 1022-1336. Publisher: Wiley-VCH Verlag GmbH & Co. KGaA.

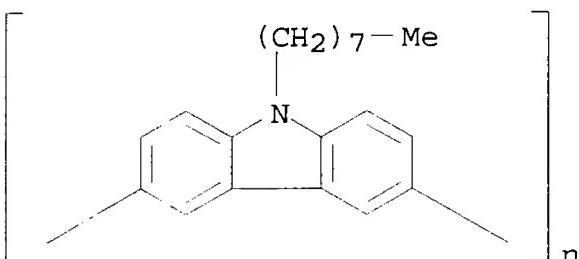
AB A series of novel carbazole-based sol. copolymers of different compn. was synthesized by Suzuki coupling reaction. Efficient energy transfer from the wide-band-gap segment **polycarbazole** due to exciton trapping on narrow-band-gap bis(thienyl)benzothiadiazole sites has been obsd. Maximum electroluminescence wavelengths of the copolymers varied between 668 nm and 716 nm, and the external quantum efficiency for copolymer devices is 0.3% for copolymers with 20% benzothiadiazole content.

IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
478706-07-9P 478706-08-0P

(Suzuki coupling synthesis and characterization of red electroluminescent polymers derived from carbazole and 4,7-bis(2-thienyl)-2,1,3-benzothiadiazole)

RN 121624-04-2 ZCA

CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



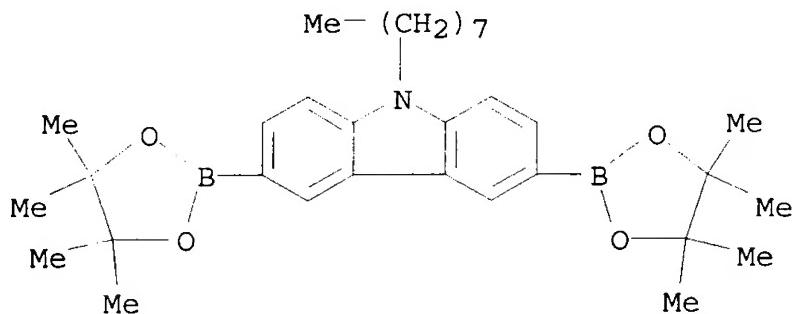
RN 478706-07-9 ZCA

CN 9H-Carbazole, 3,6-dibromo-9-octyl-, polymer with  
9-octyl-3,6-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-9H-  
carbazole (9CI) (CA INDEX NAME)

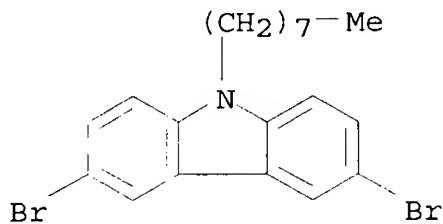
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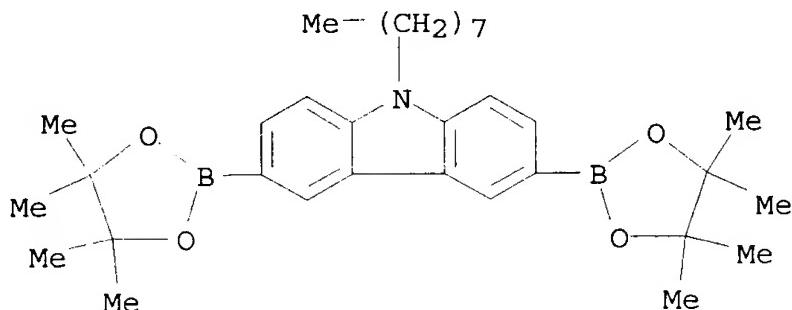


CM 2

CRN 79554-93-1  
CMF C20 H23 Br2 N

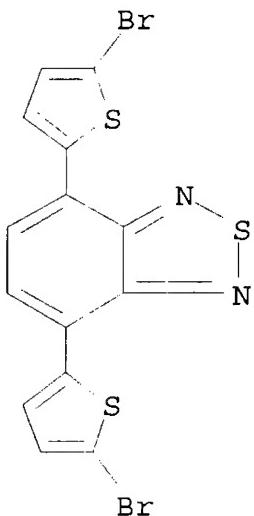
RN 478706-08-0 ZCA  
 CN 9H-Carbazole, 3,6-dibromo-9-octyl-, polymer with  
 4,7-bis(5-bromo-2-thienyl)-2,1,3-benzothiadiazole and  
 9-octyl-3,6-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-9H-  
 carbazole (9CI) (CA INDEX NAME)

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CRN 478706-06-8  
CMF C32 H47 B2 N O4

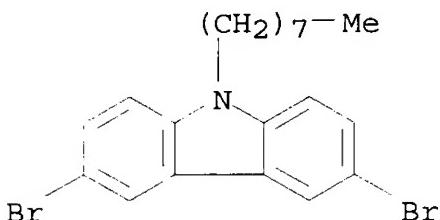
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CRN 288071-87-4  
 CMF C14 H6 Br2 N2 S3



CM 3

CRN 79554-93-1  
 CMF C20 H23 Br2 N



CC 35-5 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 36, 73, 76

IT **Polymers, preparation**  
 (**conjugated**; Suzuki coupling synthesis and characterization of red electroluminescent polymers derived from carbazole and 4,7-bis(2-thienyl)-2,1,3-benzothiadiazole)

IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 478706-07-9P 478706-08-0P  
 (Suzuki coupling synthesis and characterization of red electroluminescent polymers derived from carbazole and 4,7-bis(2-thienyl)-2,1,3-benzothiadiazole)

Red Light Emission. Morin, Jean-Francois; Leclerc, Mario (Centre de Recherche en Sciences et Ingenierie des Macromolecules, Departement de Chimie, Universite Laval, Quebec City, QC, G1K 7P4, Can.). Macromolecules, 35(22), 8413-8417 (English) 2002. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

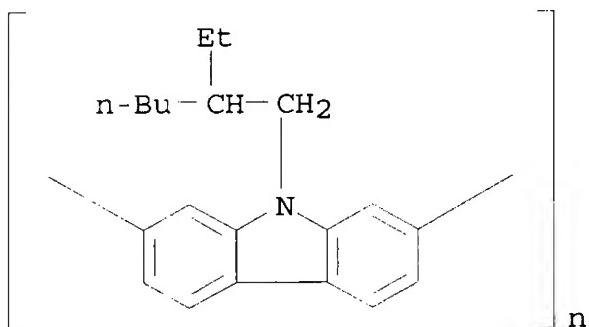
**AB** Light-emitting 2,7-carbazole-based homopolymers and copolymers were prep'd. by Yamamoto or Suzuki cross-coupling reaction. Poly(N-(2-ethylhexyl)-2,7-carbazole) (PEHC), poly(N-octadecyl-2,7-carbazole) (PODC), and poly(N-(2-ethylhexyl)-2,7-carbazole-alt-4-heptyl-2,5-pyridine) (PCPy) emit blue light while poly(N-(2-ethylhexyl)-2,7-carbazole-alt-2,3-diheptyl-5,8-quinoxaline) (PCQ) and poly(N-(2-ethylhexyl)-2,7-carbazole-alt-3,3',4''',3''''-tetramethyl-3'',4''-dihexyl-2,2':5',2'':5'',2'''':5''',2'''''-quinquethiophene-1'',1'''-dioxide) (PCPTO) emit green and red light, resp. The fluorescence quantum yield in chloroform soln. ranges from 25% for PCPTO to 83% for PCQ. All these 2,7-carbazole-based polymers do not show any evidence of excimer formation in the solid state. Most of these polymers exhibit a glass transition at ca. 60-70 .degree.C with a degrdn. temp. above 385 .degree.C. These new polymeric materials should allow the development of efficient blue-, green-, and red-light-emitting diodes with improved optical stability.

**IT** 353276-27-4P 353276-28-5P 444289-49-0P,  
Poly(9-octyl-9H-carbazole-2,7-diyl) 476360-82-4P  
476360-85-7P 476360-86-8P 476360-88-0P  
476360-89-1P 476360-90-4P 476360-91-5P

(prepn. of 2,7-carbazole-based conjugated polymers for blue, green, and red light emission using Yamamoto or Suzuki cross-coupling reaction)

**RN** 353276-27-4 ZCA

**CN** Poly[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl] (9CI) (CA INDEX NAME)



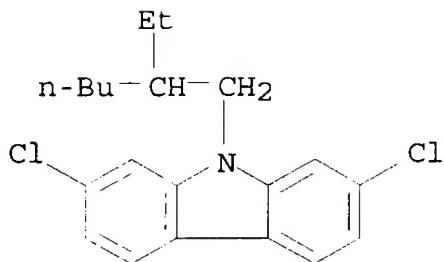
**RN** 353276-28-5 ZCA

**CN** 9H-Carbazole, 2,7-dichloro-9-(2-ethylhexyl)-, homopolymer (9CI) (CA INDEX NAME)

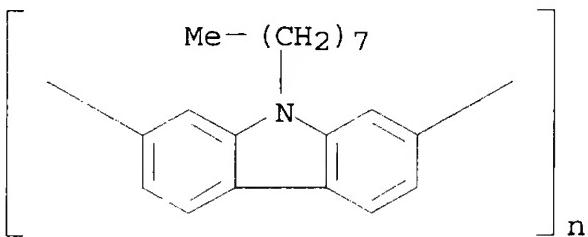
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**CRN** 353276-16-1

**CMF** C20 H23 Cl2 N



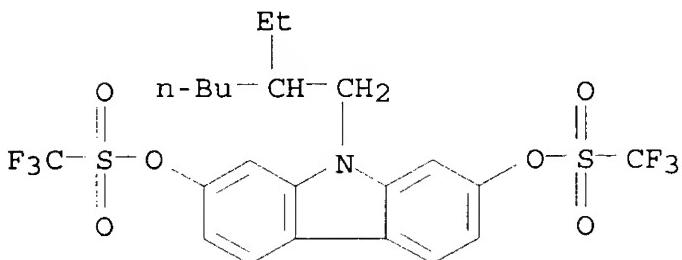
RN 444289-49-0 ZCA  
 CN Poly(9-octyl-9H-carbazole-2,7-diyl) (9CI) (CA INDEX NAME)



RN 476360-82-4 ZCA  
 CN Methanesulfonic acid, trifluoro-, 9-(2-ethylhexyl)-9H-carbazole-2,7-diyl ester, homopolymer (9CI) (CA INDEX NAME)

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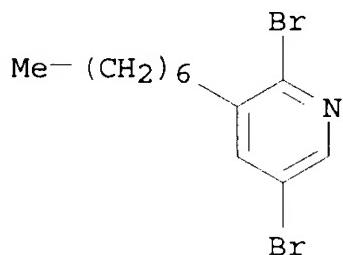
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 CMF C22 H23 F6 N O6 S2



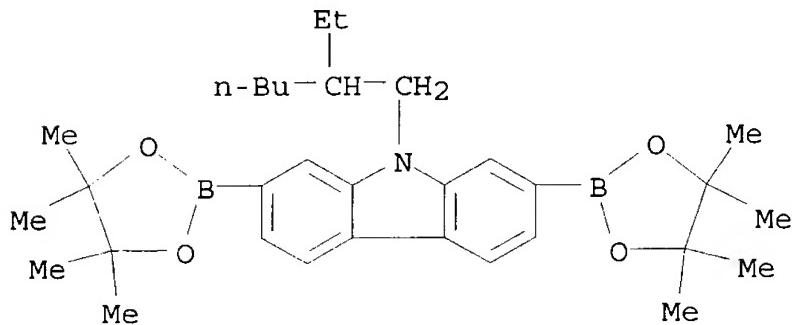
RN 476360-85-7 ZCA  
 CN 9H-Carbazole, 9-(2-ethylhexyl)-2,7-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-, polymer with 2,5-dibromo-3-heptylpyridine (9CI) (CA INDEX NAME)

CM 1

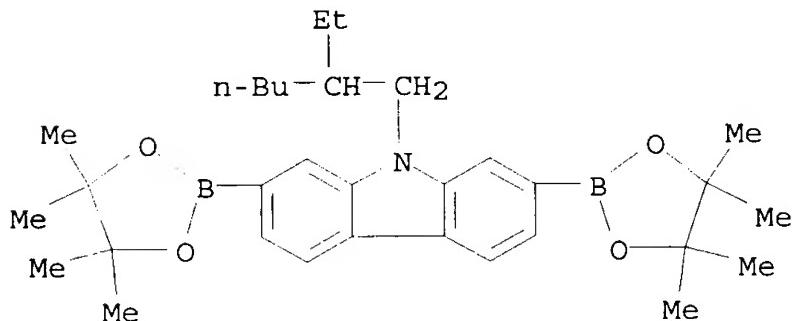
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 CMF C12 H17 Br2 N



CM 2

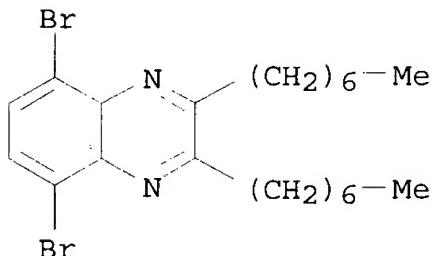
CRN 476360-83-5  
CMF C32 H47 B2 N O4RN 476360-86-8 ZCA  
CN 9H-Carbazole, 9-(2-ethylhexyl)-2,7-bis(4,4,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-, polymer with 5,8-dibromo-2,3-diheptylquinoxaline (9CI) (CA INDEX NAME)

CM 1

CRN 476360-83-5  
CMF C32 H47 B2 N O4

CM 2

CRN 158201-54-8  
CMF C22 H32 Br2 N2

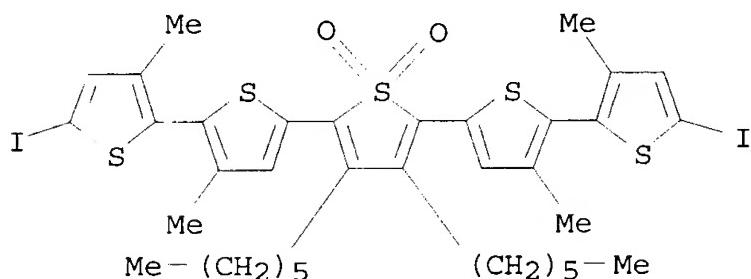


RN 476360-88-0 ZCA

CN 9H-Carbazole, 9-(2-ethylhexyl)-2,7-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-, polymer with 3'',4''-dihexyl-5,5''''-diiodo-3,3',3'''',4''''-tetramethyl-2,2':5',2'':5'',2'''':5''',2'''-quinquthiophene 1'',1''-dioxide (9CI) (CA INDEX NAME)

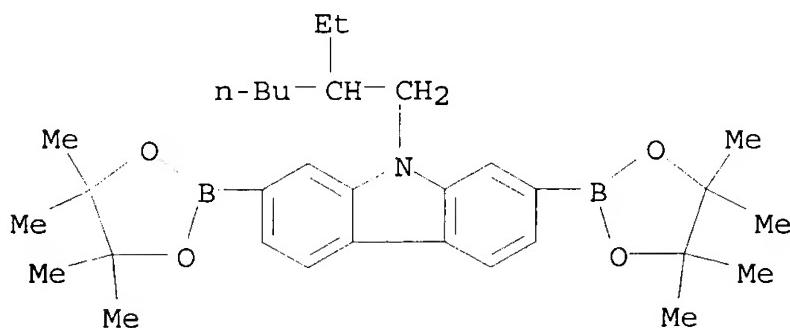
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CRN 476360-87-9  
CMF C36 H42 I2 O2 S5



CM 2

CRN 476360-83-5  
CMF C32 H47 B2 N 04



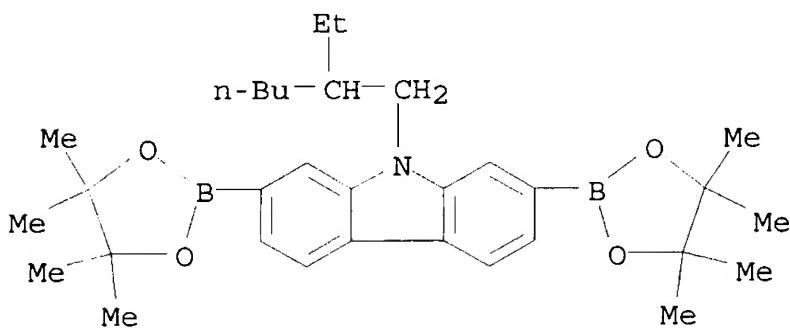
RN 476360-89-1 ZCA

CN Methanesulfonic acid, trifluoro-, 9-(2-ethylhexyl)-9H-carbazole-2,7-diyI ester, polymer with 9-(2-ethylhexyl)-2,7-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 476360-83-5

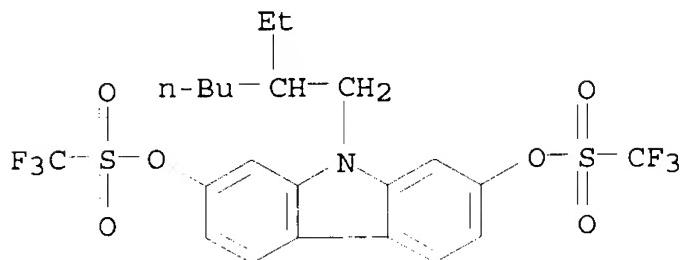
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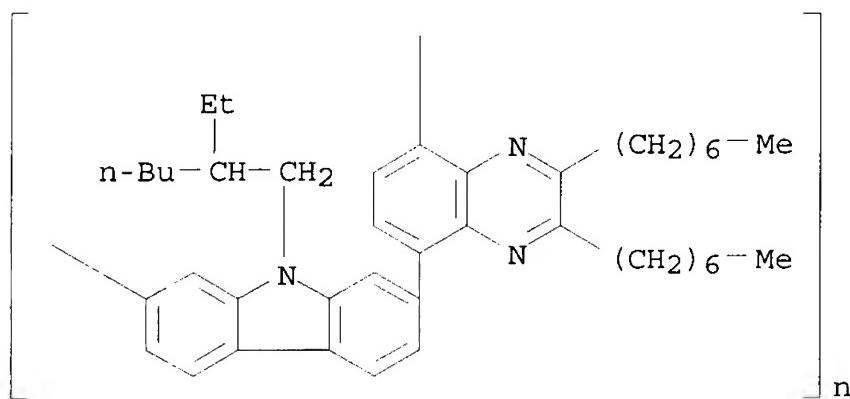
CRN 444289-56-9

CMF C22 H23 F6 N O6 S2



RN 476360-90-4 ZCA

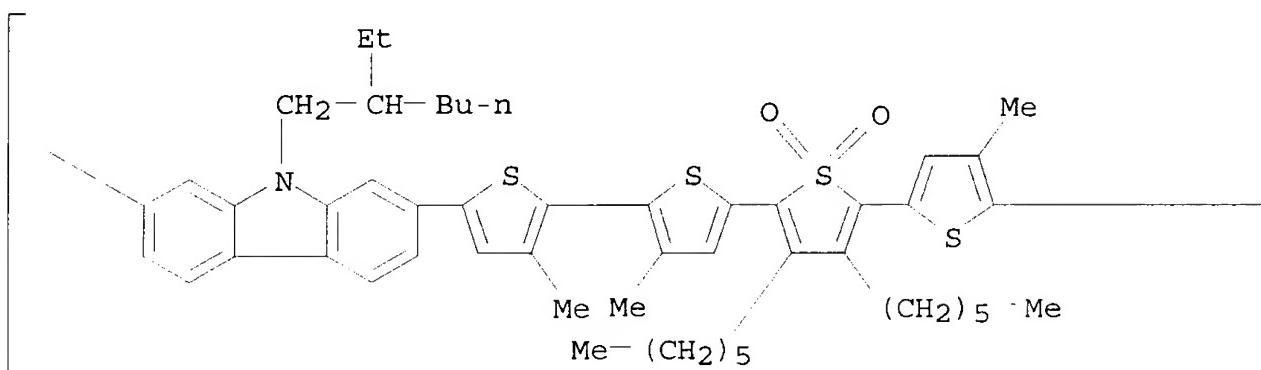
CN Poly[[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl](2,3-dioctyl-5,8-quinoxalinediyl)] (9CI) (CA INDEX NAME)



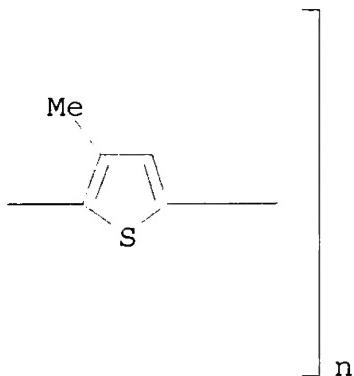
RN 476360-91-5 ZCA

CN Poly[[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl](3'',4''-dihexyl-3,3',3'',4''-tetramethyl-1'',1''-dioxido[2,2':5',2'':5'',2'''':5''',2'''''-quinquethiophene]-5,5''''-diyl)] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 73

IT **353276-27-4P 353276-28-5P 444289-49-0P,**  
**Poly(9-octyl-9H-carbazole-2,7-diyl) 476360-82-4P**  
**476360-85-7P 476360-86-8P 476360-88-0P**  
**476360-89-1P 476360-90-4P 476360-91-5P**  
**476614-67-2P**

(prepn. of 2,7-carbazole-based conjugated polymers for blue,  
green, and red light emission using Yamamoto or Suzuki  
cross-coupling reaction)

L43 ANSWER 4 OF 15 ZCA COPYRIGHT 2003 ACS

137:192422 Synthesis and characterization of poly(N-alkyl-2,7-carbazole)s: Blue light-emitting materials. Morin, J.-F.; Leclerc, M.; Levesque, I.; D'Iorio, M. (Departement de Chimie, Universite Laval, Cite Universitaire, Quebec, G1K 7P4, Can.). Materials Research Society Symposium Proceedings, 665(Electronic, Optical and Optoelectronic Polymers and Oligomers), 127-132 (English) 2002.

CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

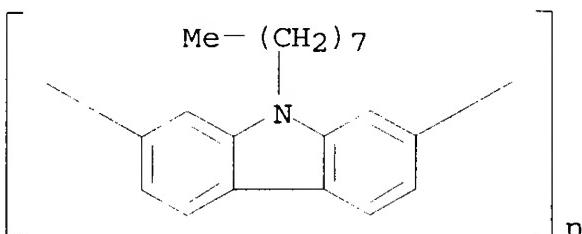
AB The synthesis of a new class of  $\pi$ -conjugated based on N-alkyl-2,7-carbazole is reported. Two different synthetic pathways were used to obtain 2,7-functionalized carbazole units. The 1st pathway leads to N-alkyl-2,7-dichlorocarbazole which undergoes a Yamamoto coupling to obtain the homopolymer. The 2nd synthetic method provides N-alkyl-2,7-diiodocarbazole. This monomer allows the use of more versatile synthetic tools such as Suzuki and Stille couplings to obtain highly regioregular copolymers.

Poly(N-(2-ethylhexyl)-2,7-carbazole) (PEHC) prep'd. using Yamamoto coupling shows strong pure blue photoluminescence (437 nm) and electroluminescence (432 nm, 225 cd/m<sup>2</sup>) with no excimer formation.

IT **444289-49-0P, Poly(9-octyl-9H-carbazole-2,7-diyl)**  
(synthesis and characterization of poly(N-alkyl-2,7-carbazole)s:  
blue light-emitting materials)

RN 444289-49-0 ZCA

CN Poly(9-octyl-9H-carbazole-2,7-diyl) (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT **444289-49-0P**, Poly(9-octyl-9H-carbazole-2,7-diyl)  
(synthesis and characterization of poly(N-alkyl-2,7-carbazole)s:  
blue light-emitting materials)

L43 ANSWER 5 OF 15 ZCA COPYRIGHT 2003 ACS

137:169909 Novel Electroluminescent Polymers Derived from Carbazole and Benzothiadiazole. Huang, Jian; Niu, Yuhua; Yang, Wei; Mo, Yueqi; Yuan, Ming; Cao, Yong (Institute of Polymer Optoelectronic Materials and Devices, South China University of Technology, Canton, 510640, Peop. Rep. China). Macromolecules, 35(16), 6080-6082 (English) 2002. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB In this communication, we present our results on the prepn. of a novel carbazole-based copolymers, poly[4,7-(2,1,3-benzothiadiazole)-3,6-[N-(2-ethylhexyl)carbazole]] (PCzBTDZ), prep'd. via palladium-catalyzed Suzuki coupling reaction. Efficient energy transfer from blue light-emitting carbazole segments to the benzothiadiazole unit occurred, and efficient orange-red light emission due to the benzothiadiazole unit was obsd.

IT **448955-93-9P**  
(prepn. and properties of)

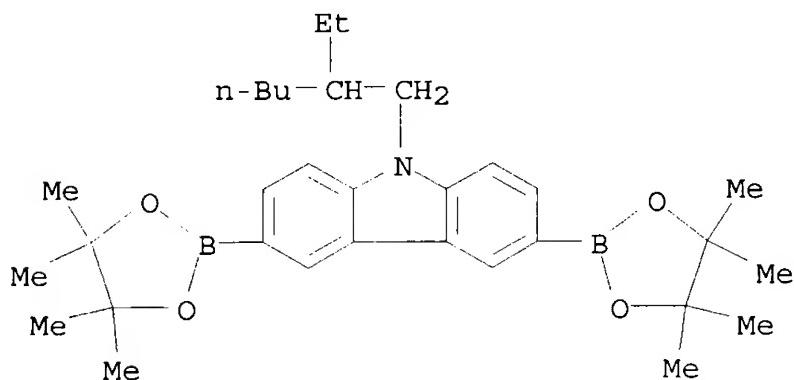
RN 448955-93-9 ZCA

CN 9H-Carbazole, 3,6-dibromo-9-(2-ethylhexyl)-, polymer with 4,7-dibromo-2,1,3-benzothiadiazole and 9-(2-ethylhexyl)-3,6-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-9H-carbazole (9CI)  
(CA INDEX NAME)

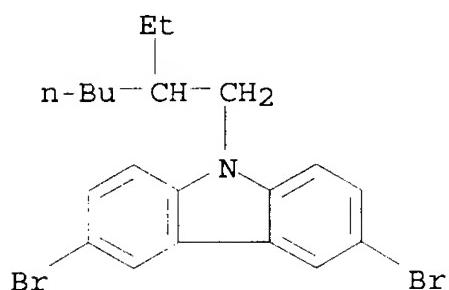
CM 1

CRN 448955-87-1

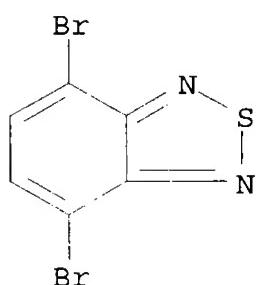
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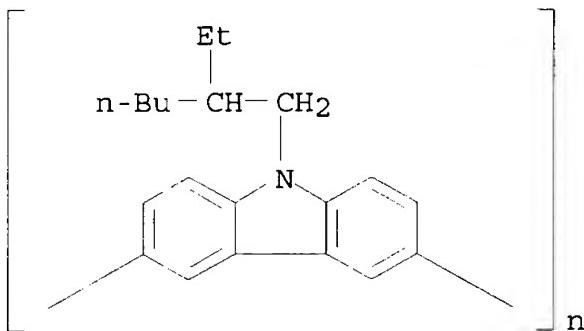
CM 2

CRN 173063-52-0  
CMF C20 H23 Br2 N

CM 3

CRN 15155-41-6  
CMF C6 H2 Br2 N2 SIT 350474-32-7P 448955-90-6P  
(prepn. and properties of polycarbazole)  
RN 350474-32-7 ZCA

CN Poly[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl] (9CI) (CA INDEX NAME)



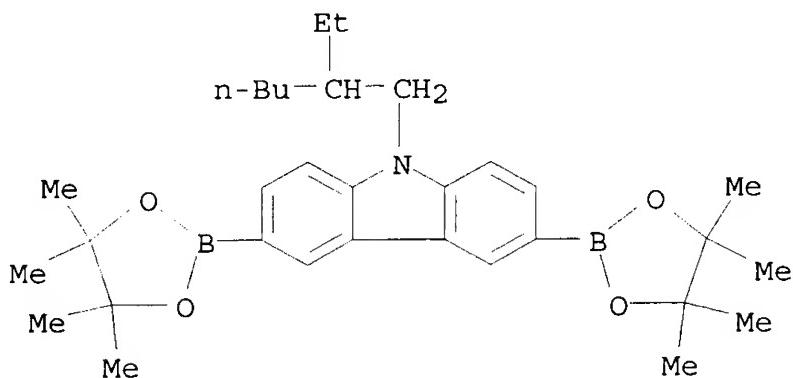
RN 448955-90-6 ZCA

CN 9H-Carbazole, 3,6-dibromo-9-(2-ethylhexyl)-, polymer with  
9-(2-ethylhexyl)-3,6-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-  
yl)-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 448955-87-1

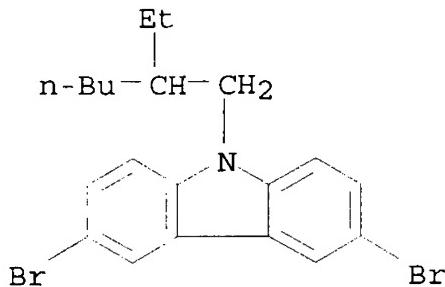
CMF C32 H47 B2 N O4



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CRN 173063-52-0

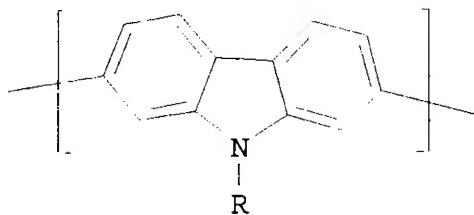
CMF C20 H23 Br2 N



- CC 35-5 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s) : 73
- ST carbazole benzothiadiazole contg **conjugated polymer** synthesis; electroluminescence photoluminescence optical electrochem property **conjugated polymer**
- IT UV absorption  
 (UV-visible; of carbazole and benzothiadiazole contg. **conjugated polymers**)
- IT **Polymers**, preparation  
 (**conjugated**, carbazole and benzothiadiazole contg.; prepn. and properties of)
- IT Band gap  
 Cyclic voltammetry  
 HOMO (molecular orbital)  
 LUMO (molecular orbital)  
 Luminescence  
 Luminescence, electroluminescence  
 Oxidation potential  
 Reduction potential  
 (of carbazole and benzothiadiazole contg. **conjugated polymers**)
- IT Suzuki coupling reaction  
 (prepn. of carbazole and benzothiadiazole contg. **conjugated polymers** by)
- IT 448955-93-9P  
 (prepn. and properties of)
- IT 350474-32-7P 448955-90-6P  
 (prepn. and properties of **polycarbazole**)

L43 ANSWER 6 OF 15 ZCA COPYRIGHT 2003 ACS  
 137:125828 **Conjugated polycarbazole** derivatives and process for the preparation thereof. Leclerc, Mario; Morin, Jean-Francois (Can.). U.S. Pat. Appl. Publ. US 2002103332 A1 20020801, 12 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-3774 20011031. PRIORITY: CA 2000-2324757 20001031.

GI



**AB** The invention relates to **conjugated polycarbazole** derivs. comprising repeating or alternating units of I (R = linear or branched alkyl group having 1 to 22 carbon atoms). The **conjugated polycarbazole** derivs. according to the invention have interesting optical and electrochem. properties which render them suitable for use in the manuf. of diverse elec., optical and electro-optical devices. The present invention also provides a process for prep. a conjugated poly(N-alkyl-2,7-carbazole) I, which comprises polymg. a N-alkyl-2,7-difunctionalized (by trifluoromethanesulfonyl group or a halogen atom) carbazole with triphenylphosphine and 2,2'-bipyridine in the presence of zinc and nickel chloride. Thus, homopolymn. of N-octyl-2,7-diiodocarbazole (prepn. given) in the presence of triphenylphosphine, 2,2'-bipyridine, and zinc and NiCl<sub>2</sub> as catalysts gave a poly(N-octyl-2,7-carbazole) at a 78% yield.

**IT** 353276-34-3P, 5,5'-Bis(trimethylstannyl)-2,2'-bithiophene-N-(2-ethylhexyl)-2,7-diiodocarbazole **copolymer**

353276-36-5P 444289-48-9P 444289-49-0P,

Poly(9-octyl-9H-carbazole-2,7-diyl) 444289-50-3P

444289-51-4P 444289-53-6P 444289-54-7P

444289-57-0P 444289-58-1P 444289-59-2P,

Poly(9-octadecyl-9H-carbazole-2,7-diyl) 444289-60-5P

(conjugated polycarbazole derivs. and process  
for prepn. thereof)

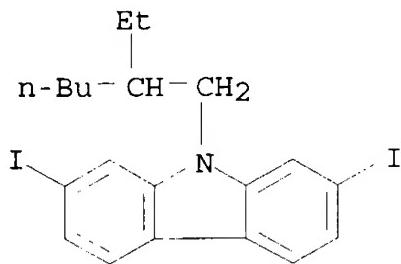
**RN** 353276-34-3 ZCA

**CN** 9H-Carbazole, 9-(2-ethylhexyl)-2,7-diido-, polymer with [2,2'-bithiophene]-5,5'-diylbis(trimethylstannane] (9CI) (CA INDEX NAME)

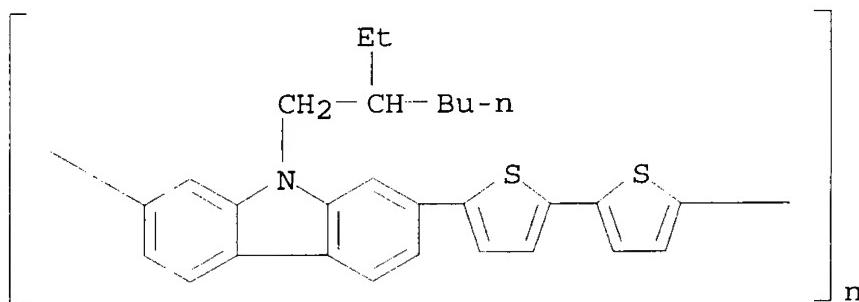
**CM** 1

**CRN** 353276-23-0

**CMF** C20 H23 I2 N

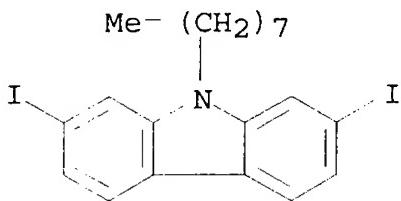


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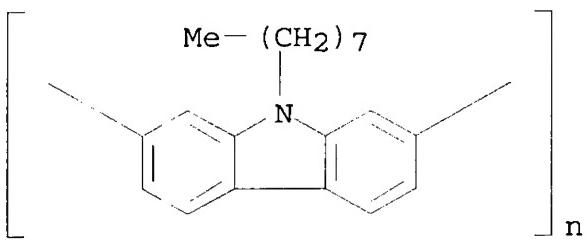
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CMF C14 H22 S2 Sn2RN 353276-36-5 ZCA  
CN Poly[[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl] [2,2'-bithiophene]-5,5'-diyl] (9CI) (CA INDEX NAME)RN 444289-48-9 ZCA  
CN 9H-Carbazole, 2,7-diiodo-9-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 406726-94-1  
CMF C20 H23 I2 N



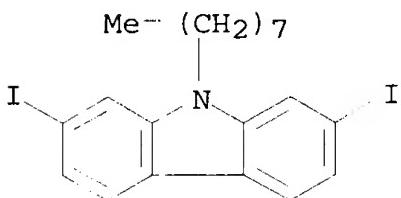
RN 444289-49-0 ZCA  
 CN Poly(9-octyl-9H-carbazole-2,7-diyl) (9CI) (CA INDEX NAME)



RN 444289-50-3 ZCA  
 CN 9H-Carbazole, 2,7-diiodo-9-octyl-, polymer with 2,2'-(9,9-dioctyl-9H-fluorene-2,7-diyl)bis[4,4,5,5-tetramethyl-1,3,2-dioxaborolane], alternating (9CI) (CA INDEX NAME)

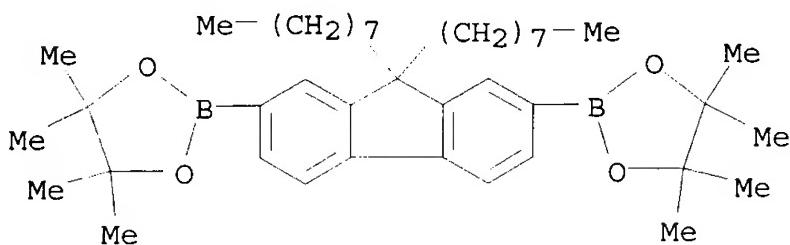
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CRN 406726-94-1  
 CMF C20 H23 I2 N



CM 2

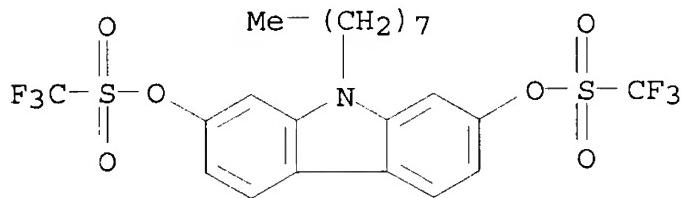
CRN 196207-58-6  
 CMF C41 H64 B2 O4



RN 444289-51-4 ZCA  
 CN Methanesulfonic acid, trifluoro-, 9-octyl-9H-carbazole-2,7-diyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

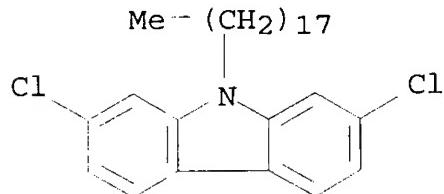
CRN 406726-90-7  
 CMF C22 H23 F6 N O6 S2



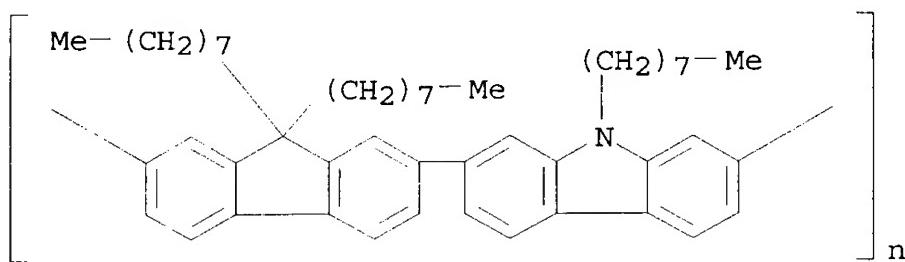
RN 444289-53-6 ZCA  
 CN 9H-Carbazole, 2,7-dichloro-9-octadecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 444289-52-5  
 CMF C30 H43 Cl2 N



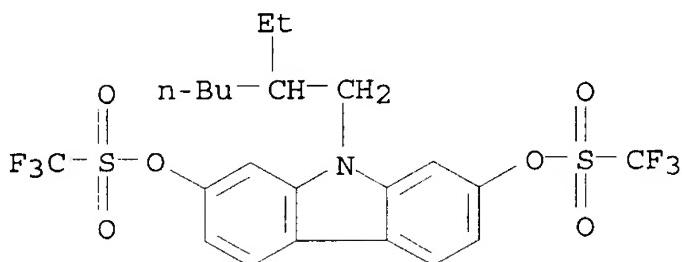
RN 444289-54-7 ZCA  
 CN Poly[(9-octyl-9H-carbazole-2,7-diyl)(9,9-dioctyl-9H-fluorene-2,7-diyl)] (9CI) (CA INDEX NAME)



RN 444289-57-0 ZCA  
 CN Methanesulfonic acid, trifluoro-, 9-(2-ethylhexyl)-9H-carbazole-2,7-diyl ester, polymer with 4-butyl-N,N-bis[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]benzenamine (9CI) (CA INDEX NAME)

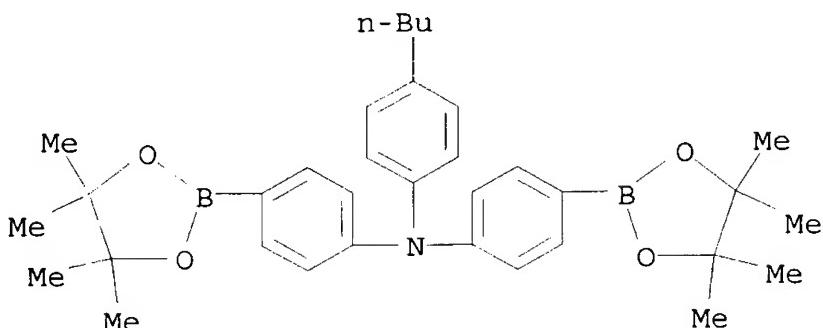
CM 1

CRN 444289-56-9  
 CMF C22 H23 F6 N O6 S2



CM 2

CRN 444289-55-8  
 CMF C34 H45 B2 N O4

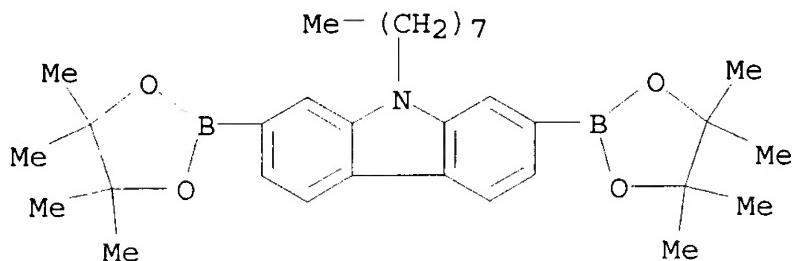


RN 444289-58-1 ZCA  
 CN Methanesulfonic acid, trifluoro-, 9-octyl-9H-carbazole-2,7-diyl ester, polymer with 9-octyl-2,7-bis(4,4,5,5-tetramethyl-1,3,2-

dioxaborolan-2-yl)-9H-carbazole (9CI) (CA INDEX NAME)

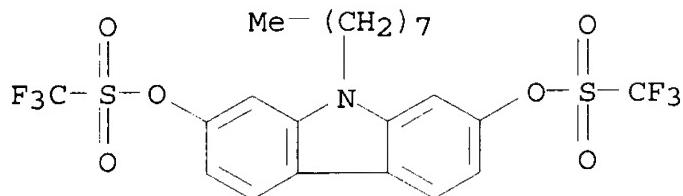
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CRN 406726-92-9  
CMF C32 H47 B2 N 04

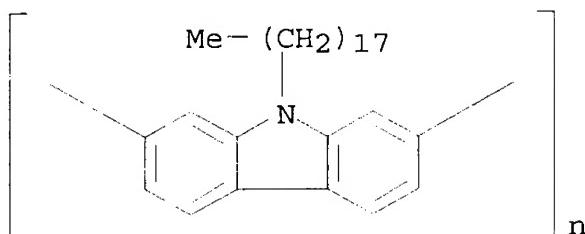


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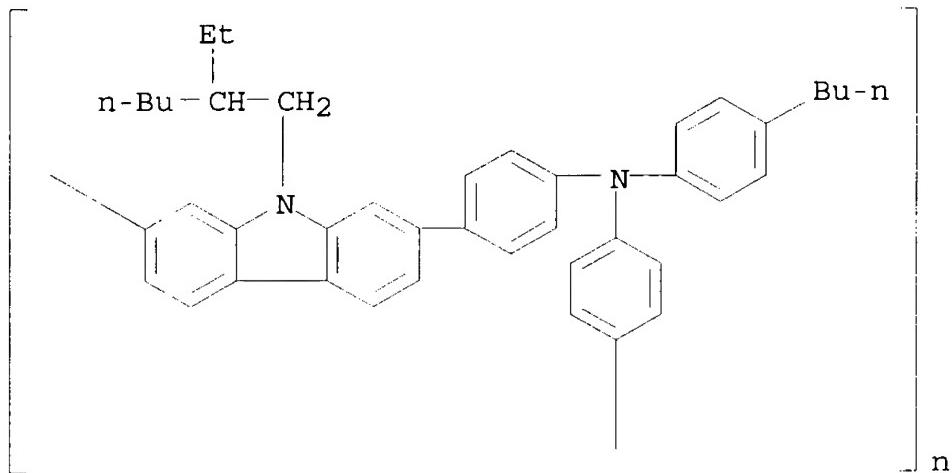
CRN 406726-90-7  
CMF C22 H23 F6 N O6 S2



RN 444289-59-2 ZCA  
CN Poly(9-octadecyl-9H-carbazole-2,7-diyl) (9CI) (CA INDEX NAME)



RN 444289-60-5 ZCA  
CN Poly[ [9-(2-ethylhexyl)-9H-carbazole-2,7-diyl]-1,4-phenylene [(4-butylphenyl)imino]-1,4-phenylene] (9CI) (CA INDEX NAME)



- IC ICM C08G073-06  
 NCL 528423000  
 CC 37-3 (Plastics Manufacture and Processing)  
 ST polyoctylcarbazole conjugated polymer manuf  
 catalyst  
 IT 366-18-7, 2,2'-Bipyridine 603-35-0, Triphenylphosphine, uses  
 7440-66-6, Zinc, uses 7718-54-9, Nickel chloride (NiCl<sub>2</sub>), uses  
 13965-03-2, Palladiumbis(triphenylphosphine) dichloride  
 (conjugated polycarbazole derivs. and process  
 for prepn. thereof)  
 IT 353276-34-3P, 5,5'-Bis(trimethylstannyl)-2,2'-bithiophene-N-(2-ethylhexyl)-2,7-diiodocarbazole copolymer  
 353276-36-5P 444289-48-9P 444289-49-0P,  
 Poly(9-octyl-9H-carbazole-2,7-diyl) 444289-50-3P  
 444289-51-4P 444289-53-6P 444289-54-7P  
 444289-57-0P 444289-58-1P 444289-59-2P,  
 Poly(9-octadecyl-9H-carbazole-2,7-diyl) 444289-60-5P  
 (conjugated polycarbazole derivs. and process  
 for prepn. thereof)  
 IT 6402-13-7P, 2,7-Diaminocarbazole 13606-06-9P 61822-18-2P,  
 2,7-Dimethoxycarbazole 102871-58-9P, 2,7-Dichlorocarbazole  
 192942-45-3P 344863-34-9P, 2,7-Dinitrocarbazole 353276-18-3P,  
 4,4'-Dinitro-2-azidobiphenyl 353276-21-8P, 2,7-Diiodocarbazole  
 406726-86-1P, N-Octyl-2,7-dimethoxycarbazole 406726-88-3P,  
 N-Octyl-2,7-hydroxycarbazole  
 (intermediate; conjugated polycarbazole  
 derivs. and process for prepn. thereof)  
 IT 353276-16-1P, N-[(2-Ethylhexyl)-2,7-dichlorocarbazole]  
 406726-90-7P, N-Octyl-2,7-bis(trifluoromethanesulfonyloxy)carbazole  
 406726-92-9P, N-Octyl-2,7-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)carbazole 406726-94-1P, N-Octyl-2,7-diiodocarbazole  
 444289-52-5P, N-Octadecyl-2,7-dichlorocarbazole  
 (monomer; conjugated polycarbazole derivs.  
 and process for prepn. thereof)

IT 51787-75-8, 4,4'-Dinitro-2-biphenylamine  
 (starting compd.; conjugated polycarbazole  
 derivs. and process for prepn. thereof)

L43 ANSWER 7 OF 15 ZCA COPYRIGHT 2003 ACS

137:125484 Synthesis and blue luminescence of a soluble newly designed carbazole main-chain polymer. Cloutet, E.; Olivero, C.; Ades, D.; Castex, M.-C.; Siove, A. (Universite Bordeaux 1, Laboratoire de Chimie des Polymeres Organiques (CNRS-UMR 5629), ENSCPB, Pessac, 33607, Fr.). Polymer, 43(12), 3489-3495 (English) 2002. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

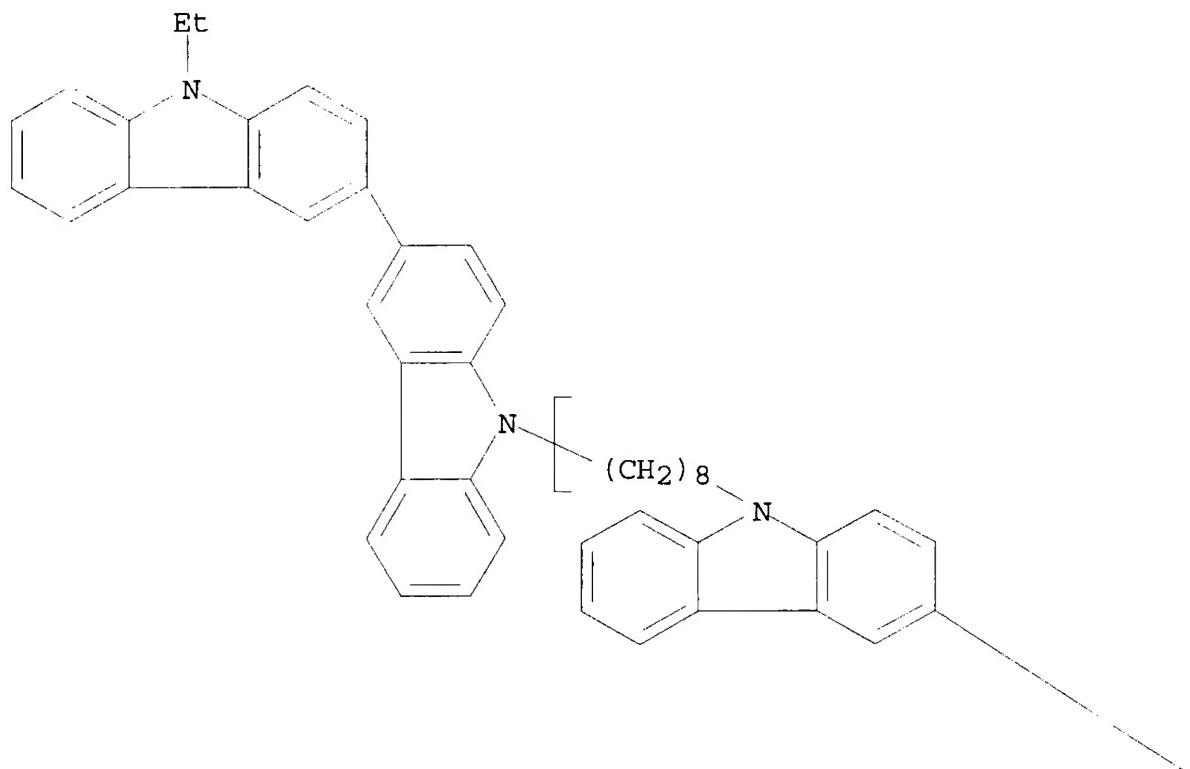
AB A new electroactive polymer with alternating conjugated-nonconjugated repeating units in the main chain was synthesized by step growth polymn. of .alpha.,.omega.-bis(N-carbazolyl)octane in chloroform soln. with an excess of iron trichloride, and in the presence of N-ethylcarbazole as a terminating agent. The resulting .alpha.,.omega.-N-ethylcarbazole terminated poly(3,3'-bicarbazyl-N,N'-octylene)s are readily sol. in common org. solvents and have good film-forming capabilities, partly because of the special design of the polymer backbone constituted by stiff bicarbazyl chromophores linked by flexible eight-carbon segments. Sol. materials with mol. wts. up to 105 g/mol and polydispersity indexes around 3.3 were obtained. Purified samples exhibiting quite low polydispersity indexes (in the range 1.5-1.7) can be prep'd. by a selective fractionation of the crude polymer from benzene/methanol mixts. Structural anal. of these new 'stairs-like' polymers disclosed their well-defined character with an arom. linkage exclusively at position 3 on the carbazole moieties. Electrochem. studies of polymer films exhibited two reversible redox processes between 0 and 1.5 V vs. SCE. The photoluminescence (PL) of the polymer in soln. and as cast films revealed an intense blue emission and the same intensity level as that of the N,N'-diethyl-3,3'-bicarbazyl mol., taken as a model of the arom. segment of the repeating unit. Such a processable and purifiable polymer with bicarbazyl-isolated fluorophores is quite promising for the fabrication of efficient blue light-emitting devices.

IT 443873-59-4P  
 (synthesis and blue luminescence of sol. newly designed carbazole main-chain polymer)

RN 443873-59-4 ZCA

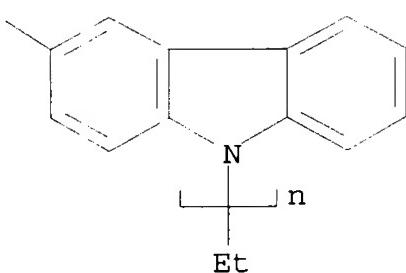
CN Poly([3,3'-bi-9H-carbazole]-9,9'-diyl-1,8-octanediyyl),  
 .alpha.-ethyl-.omega.- (9'-ethyl[3,3'-bi-9H-carbazol]-9-yl)- (9CI)  
 (CA INDEX NAME)

PAGE 1-A



PAGE 2-A

PAGE 2-B



ST blue luminescence **polycarbazole**; biscarbazolyloctane  
 polymer blue luminescence; polybiscarbazoyloctylene blue luminescence  
 IT 86-28-2DP, N-Ethylcarbazole, reaction products with  
 .alpha.,.omega.-bis(N-carbazolyl)octane polymer 350715-88-7DP,  
 1,8-Di(9-carbazolyl)octane homopolymer, N-ethylcarbazolyl-terminated  
**443873-59-4P**  
 (synthesis and blue luminescence of sol. newly designed carbazole  
 main-chain polymer)

L43 ANSWER 8 OF 15 ZCA COPYRIGHT 2003 ACS

136:295169 The First High Molecular Weight Poly(N-alkyl-3,6-carbazole)s.  
 Zhang, Zhong-Biao; Fujiki, Michiya; Tang, Hong-Zhi; Motonaga, Masao;  
 Torimitsu, Keiichi (NTT Basic Research Laboratories, NTT  
 Corporation, and CREST-JST, Morinosato, Atsugi, Kanagawa, 243-0198,  
 Japan). Macromolecules, 35(6), 1988-1990 (English) 2002. CODEN:  
 MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB The synthesis of poly(N-alkyl-3,6-carbazole)s (alkyl = decyl and  
 3,7-dimethyloctyl) with high mol. wts. by applying the reverse addn.  
 order of Ni catalyst based on the well-established Yamamoto coupling  
 method and some preliminary studies on their thermal and optical  
 properties are reported. The **polycarbazoles** possess good  
 solv., film-forming ability, thermal stability, and moderately high  
 photoluminescence.

IT **188032-44-2P 188738-54-7P**, Poly(9-decyl-9H-  
 carbazole-3,6-diyl) **409104-52-5P 409104-53-6P**  
 (nickel-catalyzed prepn. and properties of high-mol.-wt.  
 N-alkyldibromocarbazole homopolymers)

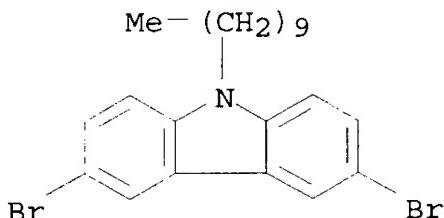
RN 188032-44-2 ZCA

CN 9H-Carbazole, 3,6-dibromo-9-decyl-, homopolymer (9CI) (CA INDEX  
 NAME)

CM 1

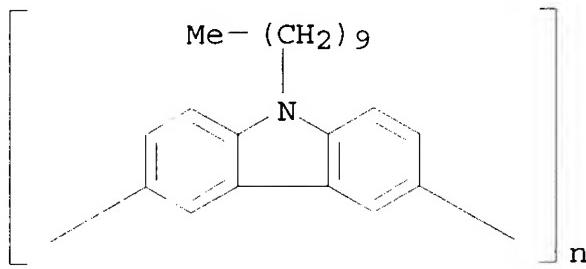
CRN 188032-43-1

CMF C22 H27 Br2 N



RN 188738-54-7 ZCA

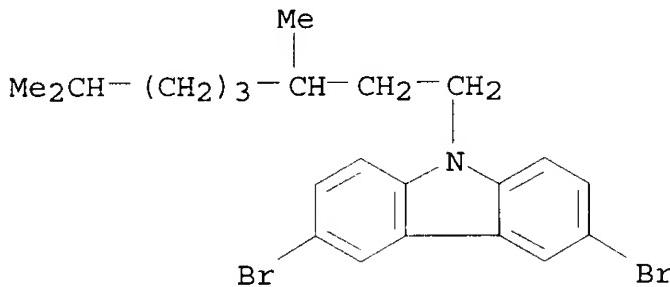
CN Poly(9-decyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



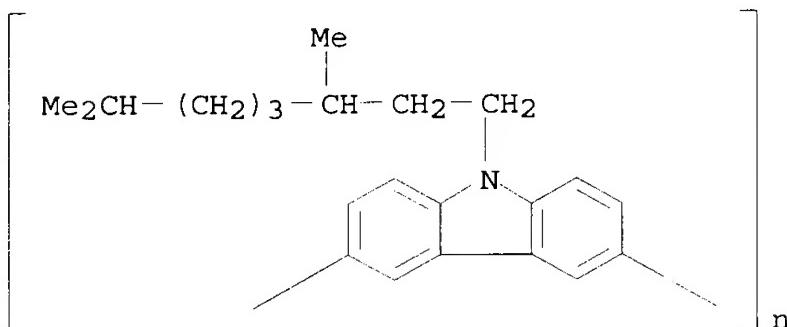
RN 409104-52-5 ZCA  
 CN 9H-Carbazole, 3,6-dibromo-9-(3,7-dimethyloctyl)-, homopolymer (9CI)  
 (CA INDEX NAME)

CM 1

CRN 409104-51-4  
 CMF C<sub>22</sub> H<sub>27</sub> Br<sub>2</sub> N



RN 409104-53-6 ZCA  
 CN Poly[9-(3,7-dimethyloctyl)-9H-carbazole-3,6-diyl] (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 36, 73  
 ST polyalkylcarbazole prep thermal property luminescence;  
 conjugated alkylated polycarbazole thermal optical

IT property  
**Polymers, preparation**  
(conjugated; nickel-catalyzed prepn. and properties of  
high-mol.-wt. N-alkyldibromocarbazole homopolymers)  
IT **188032-44-2P 188738-54-7P**, Poly(9-decyl-9H-  
carbazole-3,6-diyl) **409104-52-5P 409104-53-6P**  
(nickel-catalyzed prepn. and properties of high-mol.-wt.  
N-alkyldibromocarbazole homopolymers)

1.43 ANSWER 9 OF 15 ZCA COPYRIGHT 2003 ACS

136:279781 Electrochemical, conductive, and magnetic properties of  
2,7-carbazole-based conjugated polymers. Zotti, Gianni; Schiavon,  
Gilberto; Zecchin, Sandro; Morin, Jean-Francois; Leclerc, Mario  
(Istituto di Polarografia ed Elettrochimica Preparativa, Consiglio  
Nazionale delle Ricerche, Padua, 35020, Italy). Macromolecules,  
35(6), 2122-2128 (English) 2002. CODEN: MAMOBX. ISSN: 0024-9297.  
Publisher: American Chemical Society.

AB Publisher: American Chemical Society.  
 Novel poly(2,7-carbazole)s (i.e., poly(N-octyl-2,7-carbazole-diyl) and poly(N-(4-hexyl-benzoyl)-2,7-carbazole-diyl)) and their alternating thiophene, bi-thiophene, and 3,4-ethylenedioxy-2,5-thienylene copolymers have been investigated by cyclic voltammetry, UV-vis spectroelectrochem., electrochem. quartz crystal microbalance, in-situ ESR, and in-situ cond. techniques. All polymer films undergo reversible oxidn. and partially reversible redn. processes. In poly(N-octyl-2,7-carbazole-diyl), two isoelectronic oxidn. processes produce radical cations and dication with charge localization at the carbazole subunits. The presence of a strong electron-withdrawing substituent onto the nitrogen atom in the homopolymer leads to an increase by 3 orders of magnitude of the cond. (i.e., 1 .times. 10<sup>-2</sup> S/cm). Similarly, in alternating copolymers, the oxidative charge is more delocalized over the polyconjugated backbone with in-situ conductivities in the range of 4 .times. 10<sup>-2</sup>-4 .times. 10<sup>-3</sup> S/cm.

IT 406726-95-2P 406726-96-3P 406726-97-4P

406726-98-5P

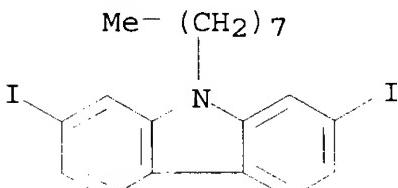
(2,7-carbazole-based conjugated polymers)

RN 406726-95-2 ZCA

CN 9H-Carbazole, 2,7-diiodo-9-octyl-, polymer with 2,5-thiophenedivibis(trimethylstannane) (9CI) (CA INDEX NAME)

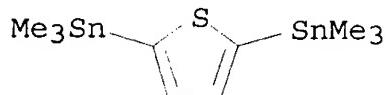
CM 1

CRN 406726-94-1  
CME C20 H23 T2 N

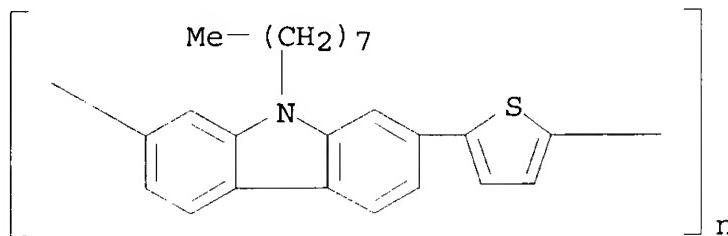


CM 2

CRN 86134-26-1  
 CMF C10 H20 S Sn2



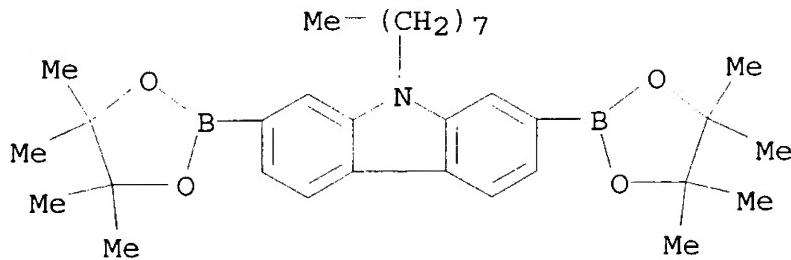
RN 406726-96-3 ZCA  
 CN Poly[(9-octyl-9H-carbazole-2,7-diyl)-2,5-thiophenediyl] (9CI) (CA INDEX NAME)



RN 406726-97-4 ZCA  
 CN 9H-Carbazole, 9-octyl-2,7-bis(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-, polymer with 5,7-dibromo-2,3-dihydrothieno[3,4-b]-1,4-dioxin (9CI) (CA INDEX NAME)

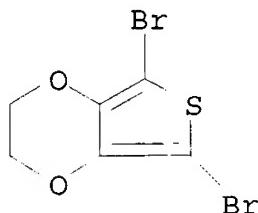
CM 1

CRN 406726-92-9  
 CMF C32 H47 B2 N O4

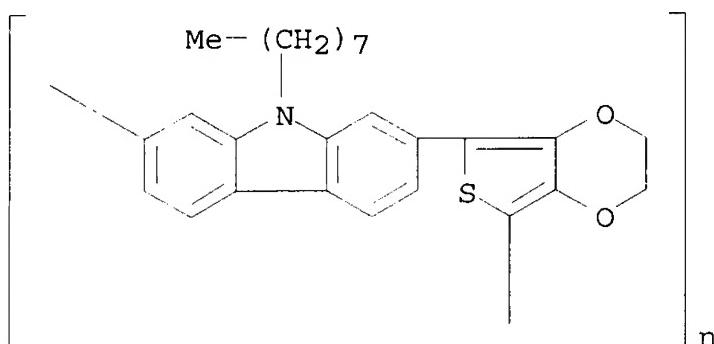


CM 2

CRN 174508-31-7  
 CMF C6 H4 Br2 O2 S



RN 406726-98-5 ZCA  
 CN Poly[(9-octyl-9H-carbazole-2,7-diyl)thieno[3,4-b]-1,4-dioxin-5,7-diyl] (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 37, 72, 76  
 IT 406726-95-2P 406726-96-3P 406726-97-4P  
 406726-98-5P 406726-99-6P 406727-00-2P 406727-01-3P  
 406727-02-4P  
 (2,7-carbazole-based conjugated polymers)

L43 ANSWER 10 OF 15 ZCA COPYRIGHT 2003 ACS  
 135:153195 Syntheses of **Conjugated Polymers** Derived  
 from N-Alkyl-2,7-carbazoles. Morin, Jean-Francois; Leclerc, Mario  
 (Canada Research Chair in Polymer Chemistry Department of Chemistry  
 Centre de Recherche en Sciences et Ingénierie des Macromolécules,  
 Université Laval, Québec City, QC, G1K 7P4, Can.). Macromolecules,  
 34(14), 4680-4682 (English) 2001. CODEN: MAMOBX. ISSN: 0024-9297.  
 Publisher: American Chemical Society.  
 AB N-alkyl-2,7-dichlorocarbazoles were prep'd. in three straightforward  
 steps, Suzuki coupling, reductive Cadogan ring closure, and  
 alkylation. Homopolymers were achieved by reductive Yamamoto  
 reaction of N-alkyl-2,7-dihalo-carbazoles in the presence of P(Ph)<sub>3</sub>,  
 Zn, 2,2'-bipyridine, and NiCl<sub>2</sub> catalyst system. Alternating  
**conjugated copolymers** were prep'd. by Suzuki  
 coupling of diboronic functionalized arom. compds. and  
 N-alkyl-2,7-diiodocarbazole (or dibromo) derivs. The resulting  
 conjugated poly(N-octyl-2,7-carbazole-alt-9,9-dioctyl-2,7-fluorene)s  
 are completely sol. in common org. solvents, such as chloroform and  
 THF. However, poly(N-octyl-2,7-carbazole) and poly[N-(2-ethylhexyl)-

2,7-carbazole] are only partially sol. (ca. 50 % fraction) and an even smaller fraction (ca. 10 %) of poly[N-(2-ethylhexyl)-2,7-carbazole-alt-5,5'-(2,2'-bithiophene)] is sol. in these solvents. In dil. solns. or as thin films poly(N-octyl-2,7-carbazole) exhibits an absorption max. around 380-390 nm, leading to a pale yellow color and does not exhibit thermochromic or solvatochromic properties, however it has an intense blue emission upon radiative excitation, with a quantum yield of about 80% in chloroform, at room temp. The pale yellow poly(N-octyl-2,7-carbazole-alt-9,9-dioctyl-2,7-fluorene) exhibits soln. and solid-state blue emission (without the presence of excimer) with a max. at 417 and 450 nm, resp. Poly[N-(2-ethylhexyl)-2,7-carbazole-alt-5,5'-(2,2'-bithiophene)] emits a green radiation with a max. of emission at 504 nm, the fluorescence quantum yield is 30%. Structural modifications through the synthesis of alternating copolymers makes it feasible to develop tunable light-emitting polymers.

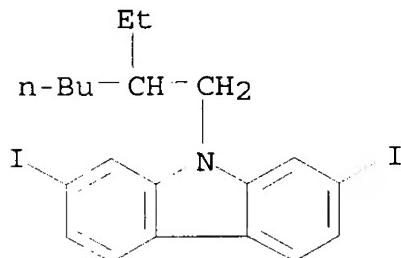
IT 353276-25-2P 353276-27-4P 353276-28-5P  
 353276-30-9P 353276-32-1P 353276-34-3P  
 353276-36-5P

(coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers and copolymers** with bithiophene)

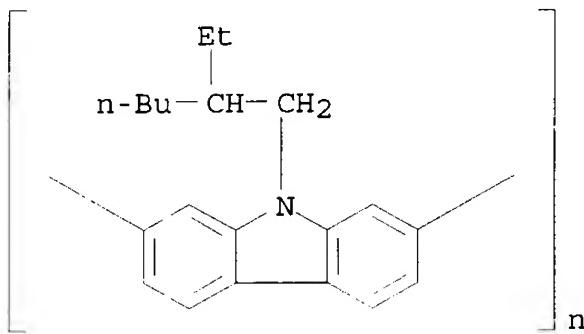
RN 353276-25-2 ZCA  
 CN 9H-Carbazole, 9-(2-ethylhexyl)-2,7-diido-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 353276-23-0  
 CMF C20 H23 I2 N



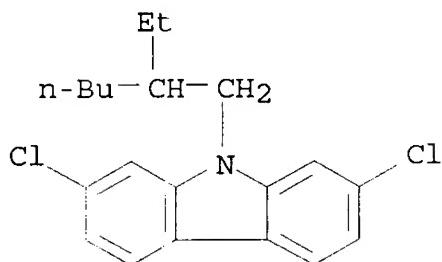
RN 353276-27-4 ZCA  
 CN Poly[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl] (9CI) (CA INDEX NAME)



RN 353276-28-5 ZCA  
 CN 9H-Carbazole, 2,7-dichloro-9-(2-ethylhexyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

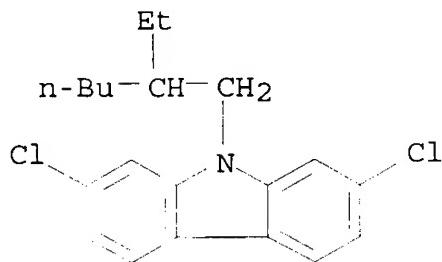
CRN 353276-16-1  
 CMF C<sub>20</sub> H<sub>23</sub> Cl<sub>2</sub> N



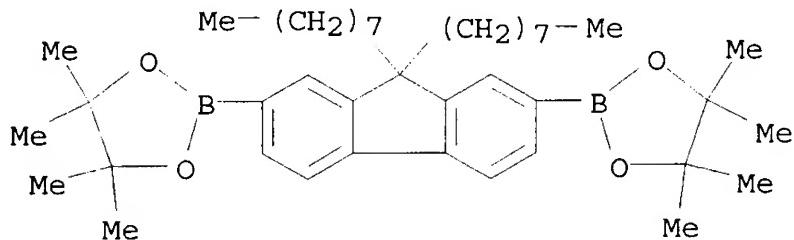
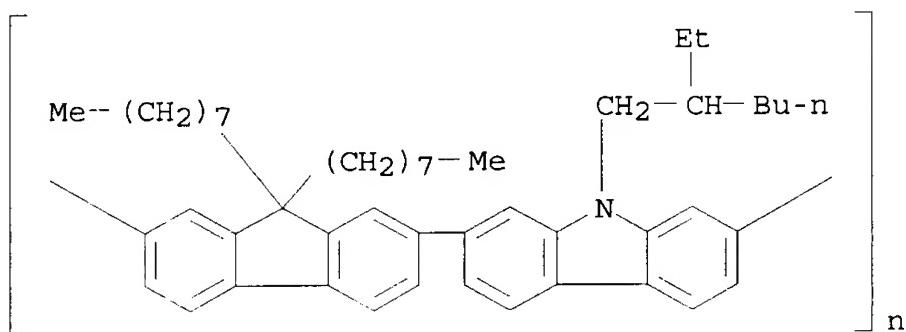
RN 353276-30-9 ZCA  
 CN 9H-Carbazole, 2,7-dichloro-9-(2-ethylhexyl)-, polymer with 2,2'-(9,9-dioctyl-9H-fluorene-2,7-diyl)bis[4,4,5,5-tetramethyl-1,3,2-dioxaborolane] (9CI) (CA INDEX NAME)

CM 1

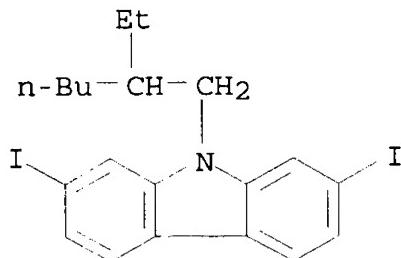
CRN 353276-16-1  
 CMF C<sub>20</sub> H<sub>23</sub> Cl<sub>2</sub> N



CM 2

CRN 196207-58-6  
CMF C41 H64 B2 O4RN 353276-32-1 ZCA  
CN Poly[[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl] (9,9-dioctyl-9H-fluorene-2,7-diyl)] (9CI) (CA INDEX NAME)RN 353276-34-3 ZCA  
CN 9H-Carbazole, 9-(2-ethylhexyl)-2,7-diiodo-, polymer with [2,2'-bithiophene]-5,5'-diylbis(trimethylstannane] (9CI) (CA INDEX NAME)

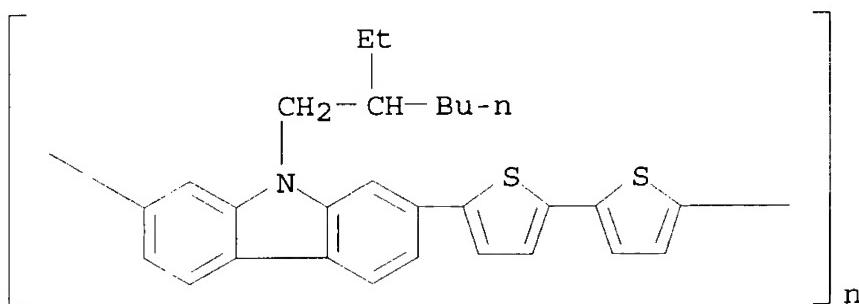
CM 1

CRN 353276-23-0  
CMF C20 H23 I2 N

CM 2

CRN 143367-56-0  
CMF C14 H22 S2 Sn2

RN 353276-36-5 ZCA  
 CN Poly[[9-(2-ethylhexyl)-9H-carbazole-2,7-diyl][2,2'-bithiophene]-5,5'-diyl] (9CI) (CA INDEX NAME)



- CC 35-7 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 36, 73
- ST alkylcarbazole prepn Suzuki coupling ring closure alkylation;  
 polyalkylcarbazole **conjugated polymer** prepn solv  
 optical absorption
- IT Heterocyclization  
 (Cadogan; coupling-ring closure-alkylation route in prepn. of  
 N-alkylcarbazoles and coupling **polymn.** to obtain  
**conjugated homopolymers and copolymers**  
 with bithiophene)
- IT Polymerization  
 (Yamamoto reaction; coupling-ring closure-alkylation route in  
 prepn. of N-alkylcarbazoles and coupling **polymn.** to  
 obtain **conjugated homopolymers and copolymers** with bithiophene)
- IT **Polymers, uses**  
 (**conjugated**; coupling-ring closure-alkylation route in  
 prepn. of N-alkylcarbazoles and coupling **polymn.** to  
 obtain **conjugated homopolymers and copolymers** with bithiophene)
- IT Alkylation  
 Electronic excitation  
 Fluorescence  
 Optical absorption  
 Suzuki coupling reaction

(coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)

- IT Polymers, uses  
 (polythiophenes, **polycarbazole**; coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)
- IT 13965-03-2, Bis(triphenylphosphine) palladium dichloride  
 14221-01-3, Tetrakis(triphenylphosphine) palladium (Suzuki coupling polymn. catalyst; coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)
- IT 366-18-7, 2,2'-Bipyridine 603-35-0, Triphenylphosphine, uses  
 7440-66-6, Zinc, uses 7718-54-9, Nickel chloride (NiCl<sub>2</sub>), uses (Yamamoto reductive polymn. catalyst system; coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)
- IT 353276-25-2P 353276-27-4P 353276-28-5P  
 353276-30-9P 353276-32-1P 353276-34-3P  
 353276-36-5P  
 (coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)
- IT 111-83-1, 1-Bromoocetane 1679-18-1, 4-Chlorophenylboronic acid  
 7681-11-0, Potassium iodide, reactions 18908-66-2, 2-Ethylhexyl bromide 26628-22-8, Sodium azide 41513-04-6,  
 1-Bromo-4-chloro-2-nitrobenzene 51787-75-8, 4,4'-Dinitro-2-biphenylamine  
 (coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)
- IT 6402-13-7P, 2,7-Diaminocarbazole 102871-58-9P 192942-45-3P  
 344863-34-9P 353276-18-3P 353276-21-8P  
 (intermediate; coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)
- IT 353276-16-1P 353276-23-0P  
 (monomer; coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and **copolymers** with bithiophene)
- IT 122-52-1, Triethyl phosphite  
 (ring closing reagent; coupling-ring closure-alkylation route in prepn. of N-alkylcarbazoles and coupling **polymn.** to obtain **conjugated homopolymers** and

copolymers with bithiophene)

L43 ANSWER 11 OF 15 ZCA COPYRIGHT 2003 ACS

131:88268 Synthesis and electrochemical characterization of a new polymer constituted of alternating carbazole and oxadiazole moieties. Meng, Hong; Chen, Zhi-Kuan; Yu, Wang-Lin; Pei, Jian; Liu, Xiao-Ling; Lai, Yee-Hing; Huang, Wei (Institute of Materials Research and Engineering (IMRE), National University of Singapore, Singapore, Singapore). Synthetic Metals, 100(3), 297-301 (English) 1999. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB The synthesis and electrochem. characterization are described of a copolymer contg. an electron rich carbazole moiety and an electron deficient oxadiazole unit, poly[N-(2'-ethylhexyl)-carbazole-3,6-diyl-1'',3'',4'',5''-oxadiazole-2'',5''-diyl] (PCO). PCO is sol. in THF, CHCl<sub>3</sub>, xylene, and DMSO. The structure of the polymer is confirmed by FTIR, NMR, and elemental anal. The optical and electronic properties of the polymer were studied by UV-Vis absorption spectroscopy and photoluminescence spectroscopy and cyclic voltammetry. The PCO films emit greenish-blue light (.lambda.max 485 nm) upon UV excitation. Both p-doping and n-doping processes were obsd. by cyclic voltammetry. A comparison between the properties of polycarbazole and polycarbazole-oxadiazole is presented.

IT 229626-81-7P 229626-82-8P  
 (prepn. and electronic structure and blue light emission by poly(carbazole-oxadiazole) conjugated polymer)

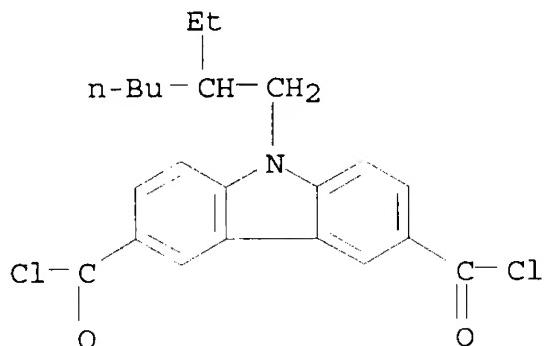
RN 229626-81-7 ZCA

CN 9H-Carbazole-3,6-dicarbonyl dichloride, 9-(2-ethylhexyl)-, polymer with hydrazine (9CI) (CA INDEX NAME)

CM 1

CRN 229626-80-6

CMF C22 H23 Cl2 N O2

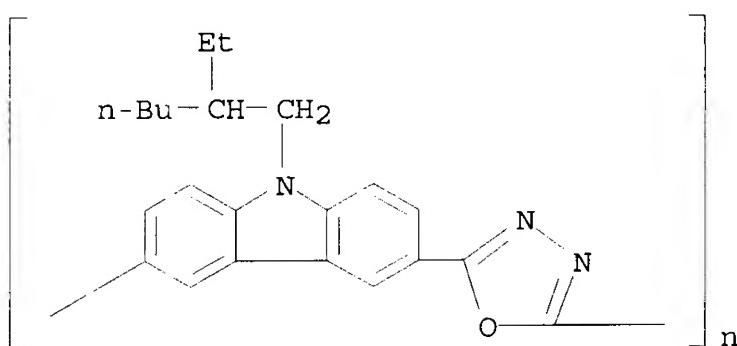


CM 2

CRN 302-01-2  
CMF H4 N2

H<sub>2</sub>N- NH<sub>2</sub>

RN 229626-82-8 ZCA  
CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]-1,3,4-oxadiazole-2,5-diyl] (9CI) (CA INDEX NAME)



- CC 35-7 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 74
- ST polycarbazole oxadiazole prep electronic structure  
photoexcitation; conjugated polycarbazole  
oxadiazole blue light emission
- IT Luminescence  
(blue light; prep. and electronic structure and blue light  
emission by poly(carbazole-oxadiazole)  
conjugated polymer)
- IT Polymers, preparation  
(conjugated; prep. and electronic structure and blue  
light emission by poly(carbazole-oxadiazole)  
conjugated polymer)
- IT Polymers, preparation  
(polycarbazoles, oxadiazole contg.; prep. and  
electronic structure and blue light emission by poly(  
carbazole-oxadiazole) conjugated  
polymer)
- IT Electron configuration  
Optical absorption  
Photoexcitation  
(prep. and electronic structure and blue light emission by  
poly(carbazole-oxadiazole) conjugated  
polymer)
- IT 187148-77-2P, N-(2-Ethylhexyl)carbazole 229626-78-2P,  
3,6-Bis(N,N-dimethylcarbamoyl)-9-(2-ethylhexyl)carbazole  
229626-79-3P, N-(2-Ethylhexyl)carbazole-3,6-dicarboxylic acid  
(intermediate; prep. and electronic structure and blue light

emission by poly(carbazole-oxadiazole)  
**conjugated polymer**)

- IT 229626-80-6P, N-(2-Ethylhexyl)carbazole-3,6-dicarbonyl chloride  
 (monomer; prepn. and electronic structure and blue light emission  
 by poly(carbazole-oxadiazole)  
**conjugated polymer**)
- IT 229626-81-7P 229626-82-8P  
 (prepn. and electronic structure and blue light emission by  
 poly(carbazole-oxadiazole) **conjugated**  
**polymer**)
- IT 79-44-7, n,N-Dimethylcarbamoyl chloride 86-74-8, 9H-Carbazole  
 7647-01-0, Hydrochloric acid, reactions 7719-09-7, Thionyl  
 chloride 18908-66-2, 2-Ethylhexylbromide  
 (prepn. and electronic structure and blue light emission by  
 poly(carbazole-oxadiazole) **conjugated**  
**polymer**)

L43 ANSWER 12 OF 15 ZCA COPYRIGHT 2003 ACS

130:237945 Synthesis and electrochemical polymerization of Ter-arenes based on N-ethylcarbazole and thiophene. Sezer, Esma; Van Hooren, Marc; Sarac, A. Sezai; Hallensleben, Manfred L. (Depertment of Chemistry, Istanbul Technical University, Istanbul, 80626, Turk.). Journal of Polymer Science, Part A: Polymer Chemistry, 37(4), 379-381 (English) 1999. CODEN: JPACEC. ISSN: 0887-624X.

Publisher: John Wiley & Sons, Inc..

AB Bis(thienyl) compds. based on N-ethylcarbazole and thiophene were prepd. to obtain extensively conjugated, low oxidn. potential monomers and the corresponding **conjugated** conducting **polymers** with properties of polythiophenes and **polycarbazoles**. The 3,6-bis(2-thiophenyl)-9-ethylcarbazole (BTECZ) monomer was prepd. via Grignard coupling of thiophene and bromoethylcarbazole using (bisdiphenylphosphino)propane nickel(II) chloride as catalyst. The cyclic voltammogram of BTECZ reveals irreversible oxidn. at about 0.849 V vs. Fc/Fc+, which is much lower than that of thiophene or ethylcarbazole, and polymn. occurs in a fast reaction after initial electron transfer. Upon repeated cycles, a new redox process develops at 0.25 V, with concurrent current response increase indicative of deposition of polymer on the electrode surface. The electrochem. polymn. reaction likely occurs through the 2-position on the thiophene ring as indicated by the appearance of only one oxidn. wave.

IT 221316-96-7P, 3,6-Bis(2-thiophenyl)-9-ethylcarbazole homopolymer  
 (prepn. of low oxidn. potential monomer and electrochem. polymn.  
 to obtain poly(N-Et carbazole-bithiophene) conducting polymers)

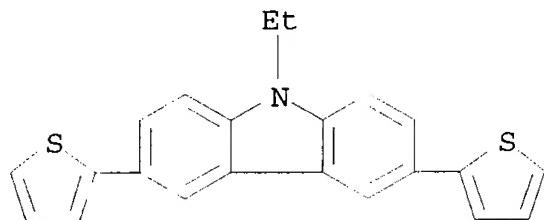
RN 221316-96-7 ZCA

CN 9H-Carbazole, 9-ethyl-3,6-di-2-thienyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 215502-69-5

CMF C22 H17 N S2



CC 35-7 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 36, 76

- IT **Polymers, preparation**  
 (conjugated; prepn. of low oxidn. potential monomer and electrochem. polymn. to obtain poly(N-Et carbazole-bithiophene) conducting polymers)
- IT **221316-96-7P, 3,6-Bis(2-thiophenyl)-9-ethylcarbazole homopolymer**  
 (prepn. of low oxidn. potential monomer and electrochem. polymn. to obtain poly(N-Et carbazole-bithiophene) conducting polymers)

L43 ANSWER 13 OF 15 ZCA COPYRIGHT 2003 ACS

125:332679 Semiconductor devices for detecting fumes from combustion processes. Pichard, Laurent; Chevrot, Claude; Schottland, Philippe; Di Marco, Stephane (Neutronic, Fr.). Fr. Demande FR 2728713 A1 19960628, 20 pp. (French). CODEN: FRXXBL. APPLICATION: FR 1994-15613 19941223.

AB The detectors, whose elec. cond. changes in contact with airborne particles generated by a fire, comprise an elec. conductive **conjugated polymer** or oligomer doped with elec. charges of a predetd. type and compensated for by counterions of the opposite charge. These detectors are suitable for detecting fumes from flaming and smoldering fires. A soln. of contg. 10-3 to 10-2 mol N-ethylcarbazole (I) in, e.g., ether, was mixed with 2-4-times the mol. amt. of FeCl<sub>3</sub>, the solvent evapd. to obtain p-doped I dimer powder for a shaped product having cond. 4 .times. 10<sup>-4</sup>/OMEGA..cm for use in fire detectors.

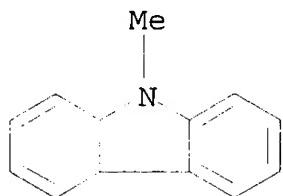
IT **90338-04-8, Poly(N-methylcarbazole)**  
 (doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

RN 90338-04-8 ZCA

CN 9H-Carbazole, 9-methyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1484-12-4  
 CMF C13 H11 N



IT 127009-88-5P

(p-doped; doped elec. conductive **conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

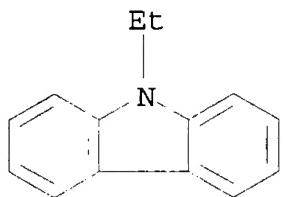
RN 127009-88-5 ZCA

CN 9H-Carbazole, 9-ethyl-, dimer (9CI) (CA INDEX NAME)

CM 1

CRN 86-28-2

CMF C14 H13 N



IC ICM G08B017-10

ICS G01N027-12

CC 47-8 (Apparatus and Plant Equipment)

IT Nitrates, uses

Perchlorates

Sulfates, uses

(anions; doped elec. conductive **conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

IT Pellets

Semiconductor devices

(doped elec. conductive **conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

IT Polyquinolines

(doped elec. conductive **conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

IT Nickel halides

(org. complexes; doped elec. conductive **conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

IT Sulfonates

- (org., anions; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Oxidizing agents  
Reducing agents  
(post-treatment with; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Metals, uses  
(substrates; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Particles  
(airborne, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Semiconductor materials  
(coatings, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Polymers, properties  
(**conjugated**, doped; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Fire  
(detectors, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Halides  
(ions, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Sulfonic acids, uses  
(lithium salts, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Polymers  
(oligomers, doped; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Quaternary ammonium compounds, uses  
(perchlorates, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Coating materials  
(semiconductive, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT Sulfonic acids, uses  
(sodium salts, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for

- IT detecting fumes from combustion processes)  
Quaternary ammonium compounds, uses  
(sulfonates, doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 4358-26-3, Tetraphenylborate  
(anions; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 15046-91-0, Silver ion (Ag<sup>2+</sup>), uses 15723-28-1, Chromium ion (Cr<sup>4+</sup>), uses 22541-63-5, Cobalt ion (Co<sup>3+</sup>), uses  
(doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 7601-89-0, Sodium perchlorate 7791-03-9, Lithium perchlorate  
(doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 25067-54-3, Polyfuran 25067-58-7, Polyacetylene 25190-62-9, Poly(p-phenylene) 25190-62-9D, Poly(p-phenylene), 3-substituted 25233-30-1, Polyaniline 25233-34-5, Polythiophene 30604-81-0, Polypyrrole 51555-21-6, **Polycarbazole** 72945-66-5, Poly(N-methylpyrrole) 84928-92-7, Poly(3-Methylthiophene) 90338-04-8, Poly(N-methylcarbazole)  
(doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 14874-70-5, Tetrafluoroborate  
(doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 66-71-7D, 1,10-Phenanthroline, complexes with nickel halides  
366-18-7D, 2,2'-Bipyridine, complexes with nickel halides  
7803-51-2D, Phosphine, trialkyl or triaryl derivs., complexes with nickel halides 13445-50-6D, Diphosphine, complexes with nickel halides  
(nickel catalyst precursors; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 13948-08-8 14452-93-8, Nitrosyl ion 15158-11-9, Copper ion (Cu<sup>2+</sup>), uses 18540-29-9, Chromium ion (Cr<sup>6+</sup>), uses 20074-52-6, Iron ion (Fe<sup>3+</sup>), uses  
(oxidant; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 127009-88-5P  
(p-doped; doped elec. conductive **conjugated polymer**- and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)
- IT 7440-02-0, Nickel, uses  
(polycondensation catalyst; doped elec. conductive

**conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

IT 68-12-2, DMF, uses 74-87-3, Methyl chloride, uses 75-52-5, Nitromethane, uses 109-99-9, uses (solvent; doped elec. conductive **conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

IT 7440-06-4, Platinum, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 12597-68-1, Stainless steel, uses (substrates; doped elec. conductive **conjugated polymer-** and oligomer-type semiconductor manuf. for detecting fumes from combustion processes)

L43 ANSWER 14 OF 15 ZCA COPYRIGHT 2003 ACS

103:30743 Electrically conducting complexes of poly(3,6-N-methylcarbazolyl methylene). Jenekhe, S. A.; Wellinghoff, S. T.; Deng, Z. (Corp. Phys. Sci. Cent., Honeywell, Inc., Bloomington, MN, USA). Report, PSC-84-37:8362; Order No. AD-A147884/1/GAR, 27 pp. Avail. NTIS From: Gov. Rep. Announce. Index (U. S.) 1985, 85(4), 82 (English) 1984.

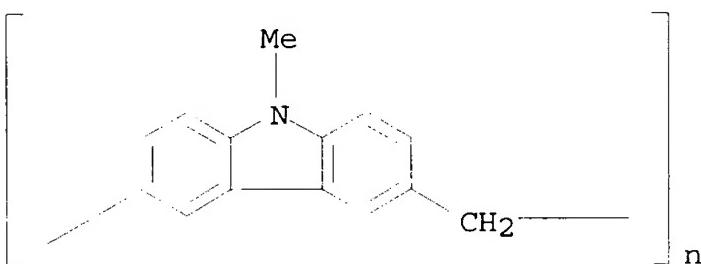
AB Poly(3,6-N-methylcarbazolyl methylene) prep'd. by acid-catalyzed condensation polymn. of N-methylcarbazole with formaldehyde exhibits p-type semiconducting properties when coped with electron acceptors such as I, Br, nitrosyl tetrafluoroborate, and nitrosyl hexafluoroantimonate. The polymer samples have glass transition temp. 100-148, chain length 13-25, and mol. wt. distribution 1.17-1.51. The polymer complexes with dopant anion (I<sup>3-</sup>, Br<sup>3-</sup>, BF<sub>4</sub><sup>-</sup>) to polymer repeating unit ratio of 0.67-0.95 have d.c. cond. of 0.001 1/.OMEGA. and a pos. thermoelec. voltage at 23. An important new feature of the methylene-bridged **polycarbazole** conducting polymers is doping-induced **polymer** backbone **conjugation** of the form-CH<sub>2</sub>- yields :CH. Evidence for this oxidn. mechanism, converting methylene linkages to methine linkages, includes elemental anal., IR spectra, proton NMR, and ESR results.

IT 97008-75-8

(elec. transport properties of doped)

RN 97008-75-8 ZCA

CN Poly[(9-methyl-9H-carbazole-3,6-diyl)methylene] (9CI) (CA INDEX NAME)



CC 76-1 (Electric Phenomena)

IT Section cross-reference(s): 36  
**97008-75-8**  
 (elec. transport properties of doped)

L43 ANSWER 15 OF 15 ZCA COPYRIGHT 2003 ACS  
 102:177309 Electrically conducting complexes of poly(3,6-N-methylcarbazolylmethylene). Jenekhe, Samson A.; Wellinghoff, Stephen T.; Deng, Zhi (Phys. Sci. Cent., Honeywell Inc., Bloomington, MN, 55420, USA). Synthetic Metals, 10(4), 281-92 (English) 1985. CODEN: SYMEDZ. ISSN: 0379-6779.

AB Poly(3,6-N-methylcarbazolylmethylene) prep'd. by acid-catalyzed condensation polymn. of N-methylcarbazole with formaldehyde exhibits p-type semiconducting properties when doped with electron acceptors such as Br, I, nitrosyl tetrafluoroborate, and nitrosyl hexafluoroantimonate. The polymer samples have glass transition temp. Tg in the range 100-148.degree., chain length 13-25, and a mol. wt. distribution of 1.17-1.51. The polymer complexes with dopant anion (I<sup>3-</sup>, Br<sup>3-</sup>, BF<sup>4-</sup>) to a polymer repeating unit ratio of 0.67-0.95, have a d.c. cond. of 10<sup>-3</sup> to 10<sup>-1</sup> .OMEGA.-1 cm<sup>-1</sup>, and a pos. thermoelec. voltage at 23.degree.. An important new feature of the methylene-bridged polycarbazole conducting polymers is doping-induced polymer backbone conjugation of the form -CH<sub>2</sub>- .fwdarw. :CH-. Evidence for this oxidn. mechanism, converting methylene linkages to methine linkages, includes elemental anal., IR spectra, proton NMR, and ESR results.

IT **72038-21-2**  
 (elec. cond. of)

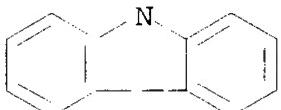
RN 72038-21-2 ZCA

CN Formaldehyde, polymer with 9-methyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 1484-12-4  
 CMF C13 H11 N

Me



CM 2

CRN 50-00-0  
 CMF C H2 O

H<sub>2</sub>C=O

CC 76-2 (Electric Phenomena)  
IT 72038-21-2  
(elec. cond. of)

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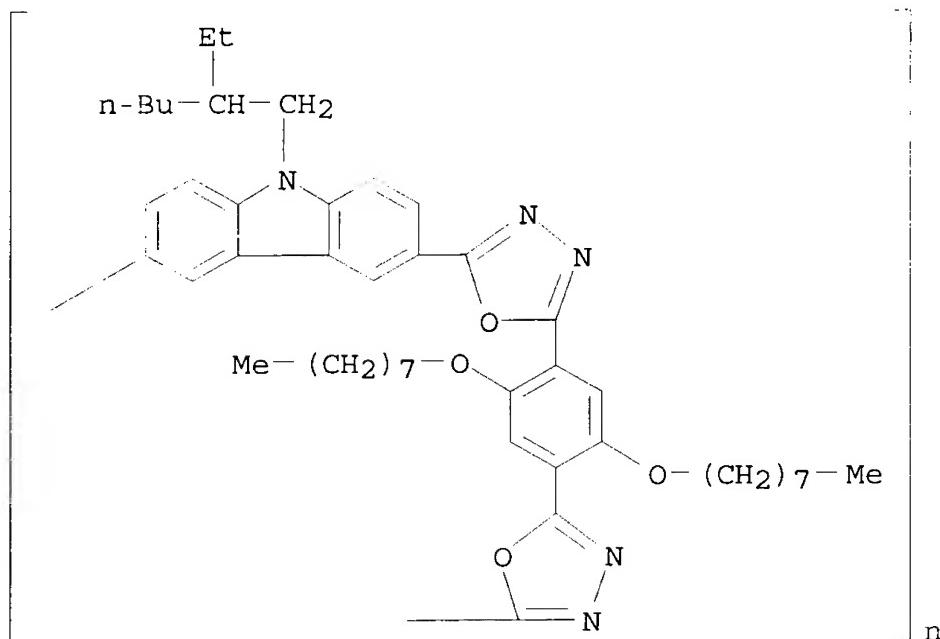
L44 ANSWER 1 OF 27 ZCA COPYRIGHT 2003 ACS  
138:90348 End-group analysis of blue light-emitting polymers using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. Chen, Hui; He, Meiyu; Pei, Jian; Liu, Bin (Department of Chemistry, Peking University, Beijing, 100871, Peop. Rep. China). Analytical Chemistry, 74(24), 6252-6258 (English) 2002. CODEN: ANCHAM. ISSN: 0003-2700. Publisher: American Chemical Society.

AB An anal. method based on matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) has been applied to provide information on the structure of a copolymer, e.g., repeat unit and end group. Seven conjugated polymers, which have been demonstrated as the active component in blue light-emitting diodes, were synthesized through Suzuki polycondensation reaction in the presence of Pd(PPh<sub>3</sub>)<sub>4</sub> catalyst. Their mol. wts. were obtained using gel permeation chromatog. anal. MALDI-TOF MS was used to investigate the structure information in detail. The proposed end-group structures were confirmed by the identity between the obsd. and the simulated isotopic distribution of each polymer. The results demonstrate that these synthetic polymers possess various end groups and even contain macrocycles. The catalyst Pd(PPh<sub>3</sub>)<sub>4</sub> was found to introduce Ph end groups via aryl-aryl exchange between the catalytic palladium intermediate and the triphenylphosphine ligand. All these results are based on the anal. of the mass spectrum data, which suggests that MALDI-TOF MS is an extraordinarily strong tool in synthetic polymer structure anal.

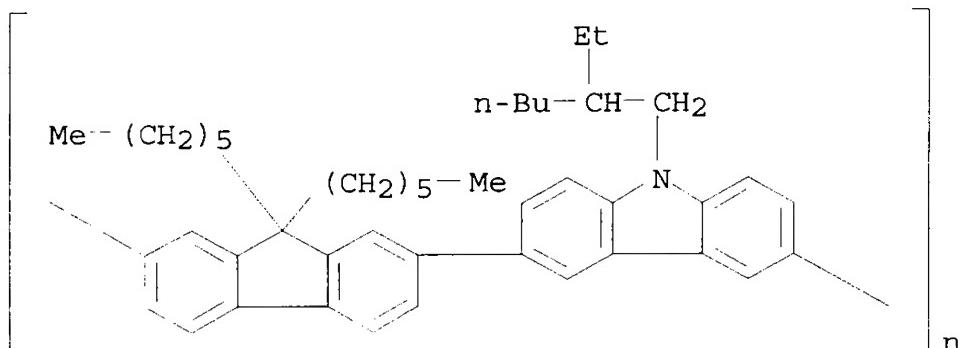
IT 244036-31-5 353246-74-9  
(end-group anal. of blue light-emitting polymers using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry)

RN 244036-31-5 ZCA

CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]-1,3,4-oxadiazole-2,5-diyl[2,5-bis(octyloxy)-1,4-phenylene]-1,3,4-oxadiazole-2,5-diyl]  
(9CI) (CA INDEX NAME)



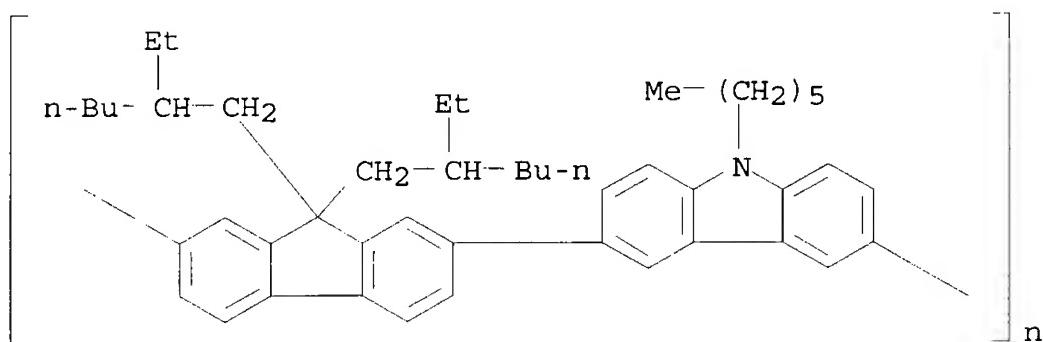
RN 353246-74-9 ZCA  
 CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl](9,9-dihexyl-9H-fluorene-2,7-diyl)] (9CI) (CA INDEX NAME)



IT 244036-31-5 353246-74-9  
 (end-group anal. of blue light-emitting polymers using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry)

L44 ANSWER 2 OF 27 ZCA COPYRIGHT 2003 ACS  
 138:80210 Large third-order nonlinear optical response of conjugated copolymers consisting of fluorene and carbazole units. Zhan, Xiaowei; Liu, Yunqi; Zhu, Daoben; Liu, Xuchun; Xu, Gang; Ye, Peixian (Institute of Chemistry, Center for Molecular Science, Chinese Academy of Sciences, Beijing, 100080, Peop. Rep. China). Chemical Physics Letters, 362(1,2), 165-169 (English) 2002. CODEN: CHPLBC.

- AB ISSN: 0009-2614. Publisher: Elsevier Science B.V..  
 Off-resonant 3rd-order nonlinear optical properties using degenerate four-wave mixing measurements in soln. at 1064 nm were studied for novel  $\pi$ -conjugated, processible, optically transparent and thermally stable copolymers constituted of carbazole and fluorene. The 2nd-order hyperpolarizability  $\gamma_{1111}$  per repeat unit of the polymer contg. alkyne segment (Cz-PFE) is  $\approx 6.5 \times 10^{-31}$  esu. The large nonlinearity of Cz-PFE is attributed to its rigid planar and intrachain charge transfer structure.
- IT 481076-48-6P  
 (large third-order nonlinear optical response of conjugated copolymers consisting of fluorene and carbazole units)
- RN 481076-48-6 ZCA
- CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)[9,9-bis(2-ethylhexyl)-9H-fluorene-2,7-diyl]] (9CI) (CA INDEX NAME)



- IT 481076-48-6P  
 (large third-order nonlinear optical response of conjugated copolymers consisting of fluorene and carbazole units)

- L44 ANSWER 3 OF 27 ZCA COPYRIGHT 2003 ACS  
 137:125479 Photoluminescent and Electrochemical Properties of Novel Poly(aryl ether)s with Isolated Hole-Transporting Carbazole and Electron-Transporting 1,3,4-Oxadiazole Fluorophores. Hwang, Shiao-Wen; Chen, Yun (Department of Chemical Engineering, National Cheng Kung University, Tainan, Taiwan). Macromolecules, 35(14), 5438-5443 (English) 2002. CODEN: MAMOBX. ISSN: 0024-9297.  
 Publisher: American Chemical Society.
- AB Four novel poly(aryl ether)s consisting of alternate isolated hole-transporting carbazole and electron-transporting 1,3,4-oxadiazole segments were synthesized from the nucleophilic displacement reaction of bis(fluoride) monomers with bis(phenol) monomers. These poly(aryl ether)s are sol. in common org. solvents and exhibit good thermal stability with 5% wt. loss temp. above 400  $^{\circ}\text{C}$  under a nitrogen atm. The photoluminescent (PL) spectra and quantum yields of these polymers are dependent on the compon. of the two isolated fluorophores. The formation of exciplex in P3 was obsd. in the film and soln. state and resulted in the lower quantum yield. The quantum yields of P4 in solns. can increase from 0.04 of

P3 to 0.36, due to the dil. effect, by introducing the inert bisphenol A segments. However, the PL spectra of P4 only showed a little blue shift in the film state. This means the interchain exciplex still dominated the emission of polymeric films. The HOMO and LUMO energy levels of these polymers have been measured from cyclic voltammetry. All the observations directly proved that the oxidn. in polymers started at the hole-transporting segments. Both the electron and hole affinities of these polymers could be enhanced simultaneously due to the introduction of isolated hole-transporting carbazole and electron-transporting 1,3,4-oxadiazole segments.

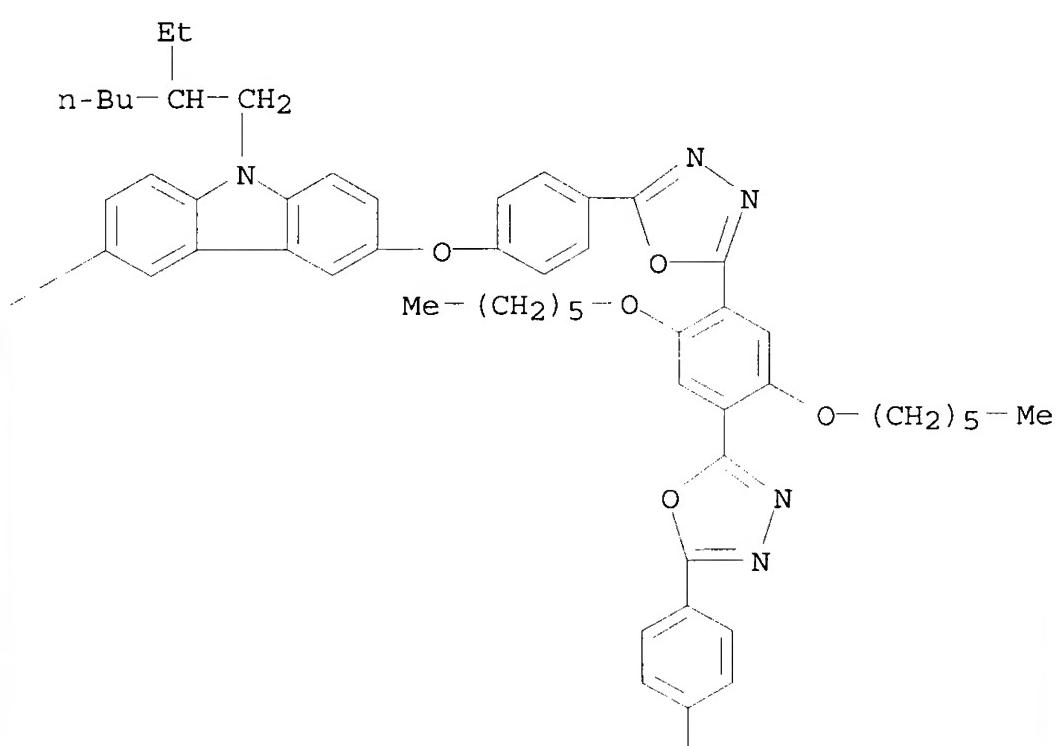
IT 444014-86-2P

(photoluminescent and electrochem. properties of poly(aryl ether)s with isolated carbazole and 1,3,4-oxadiazole fluorophores)

RN 444014-86-2 ZCA

CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]oxy-1,4-phenylene-1,3,4-oxadiazole-2,5-diyl[2,5-bis(hexyloxy)-1,4-phenylene]-1,3,4-oxadiazole-2,5-diyl-1,4-phenyleneoxy] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



n

IT 444014-86-2P

(photoluminescent and electrochem. properties of poly(aryl ether)s with isolated carbazole and 1,3,4-oxadiazole fluorophores)

L44 ANSWER 4 OF 27 ZCA COPYRIGHT 2003 ACS

136:341342 Synthesis and characterization of aromatic polyimide containing 3,6-diamino-9-alkylcarbazole and aromatic tetracarboxylic dianhydrides. Watanabe, Shinji; Yamamoto, Taizoh; Murata, Miki; Masuda, Yuzuru (Department of Materials Science, Kitami Institute of Technology, Kitami, 090-8507, Japan). High Performance Polymers, 13(4), 281-286 (English) 2001. CODEN: HPPOEX. ISSN: 0954-0083. Publisher: Institute of Physics Publishing.

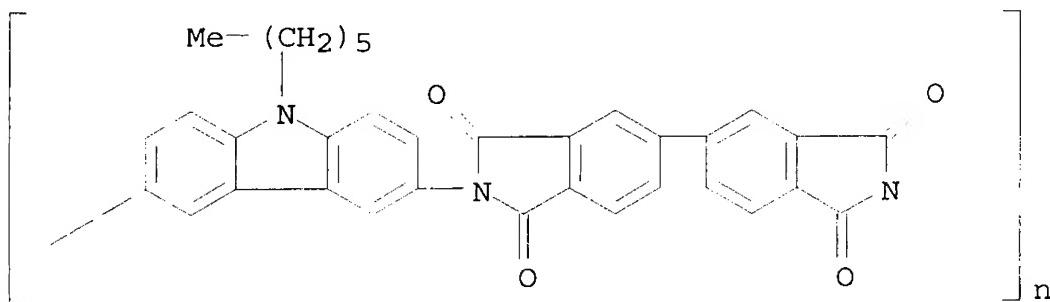
AB New sol. polyimides with inherent viscosities of 0.25-0.62 dL g-1 were synthesized from 3,6-diamino-9-alkylcarbazole and various arom. tetracarboxylic dianhydrides by the conventional two-step method, including ring-opening polyaddn. and subsequent thermal cyclodehydration. Most of the polyimides having hexyl alkyl chains were sol. in N-methylpyrrolidinone and m-cresol, while the polymers having Et chains were not sol. in org. solvents. The glass transition temps. and 10% wt. loss temps. under argon of the polyimides having hexyl chains were in the range 232.degree.-269.degree. and 485.degree.-518.degree., resp.

IT 412042-94-5P

(carbazole group-contg.; synthesis and characterization of arom. polyimides contg. 3,6-diamino-9-alkylcarbazole and arom. tetracarboxylic dianhydrides)

RN 412042-94-5 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)(1,1',3,3'-tetrahydro-1,1',3,3'-tetraoxo[5,5'-bi-2H-isoindole]-2,2'-diyl)] (9CI) (CA INDEX NAME)



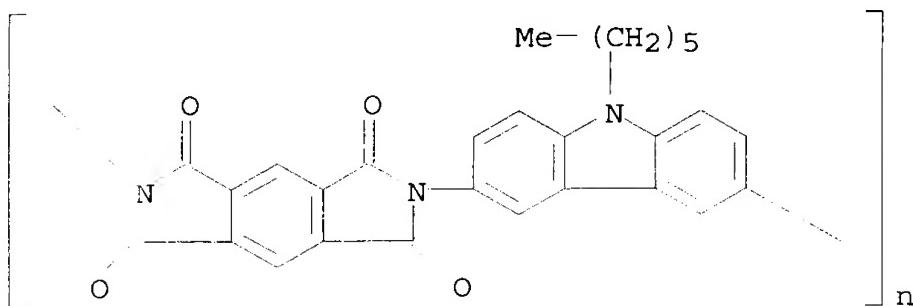
IT 412042-82-1P 412042-84-3P 412042-88-7P

412042-92-3P

(synthesis and characterization of arom. polyimides contg. 3,6-diamino-9-alkylcarbazole and arom. tetracarboxylic dianhydrides)

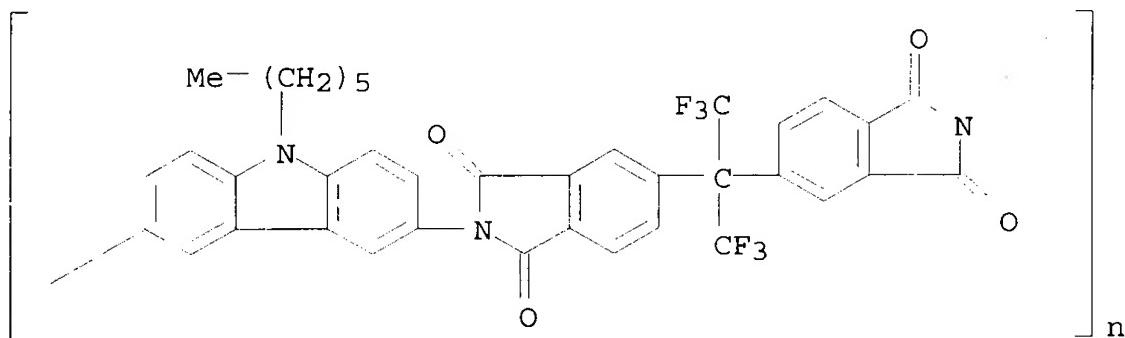
RN 412042-82-1 ZCA

CN Poly[(5,7-dihydro-1,3,5,7-tetraoxobenzo[1,2-c:4,5-c']dipyrrole-2,6(1H,3H)-diyl)(9-hexyl-9H-carbazole-3,6-diyl)] (9CI) (CA INDEX NAME)



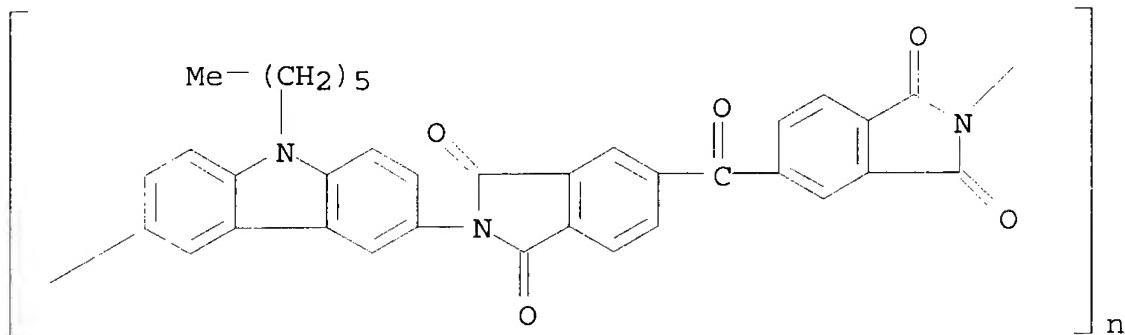
RN 412042-84-3 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene](1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)] (9CI) (CA INDEX NAME)



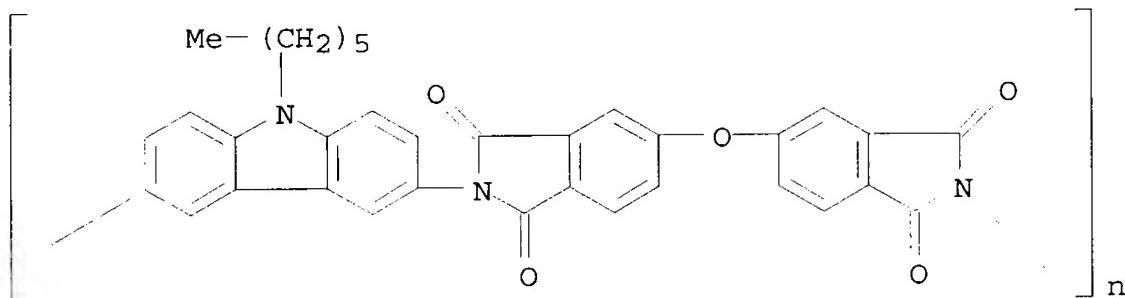
RN 412042-88-7 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)carbonyl(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)] (9CI) (CA INDEX NAME)



RN 412042-92-3 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)(1,3-dihydro-1,3-dioxo-2H-isoindole-2,5-diyl)oxy(1,3-dihydro-1,3-dioxo-2H-isoindole-5,2-diyl)] (9CI) (CA INDEX NAME)



IT 412042-94-5P

(carbazole group-contg.; synthesis and characterization of arom. polyimides contg. 3,6-diamino-9-alkylcarbazole and arom.

IT tetracarboxylic dianhydrides)  
**412042-82-1P 412042-84-3P 412042-88-7P**  
**412042-92-3P**  
(synthesis and characterization of arom. polyimides contg.  
3,6-diamino-9-alkylcarbazole and arom. tetracarboxylic  
dianhydrides)

L44 ANSWER 5 OF 27 ZCA COPYRIGHT 2003 ACS

135:273241 A New Class of Aromatic Dianhydrides for Thermostable Polyimides. Walsh, Christopher J.; Mandal, Braja K. (Chemistry Division Department of Biological Chemical and Physical Sciences, Illinois Institute of Technology, Chicago, IL, 60616, USA). Chemistry of Materials, 13(8), 2472-2475 (English) 2001. CODEN: CMATEX. ISSN: 0897-4756. Publisher: American Chemical Society.

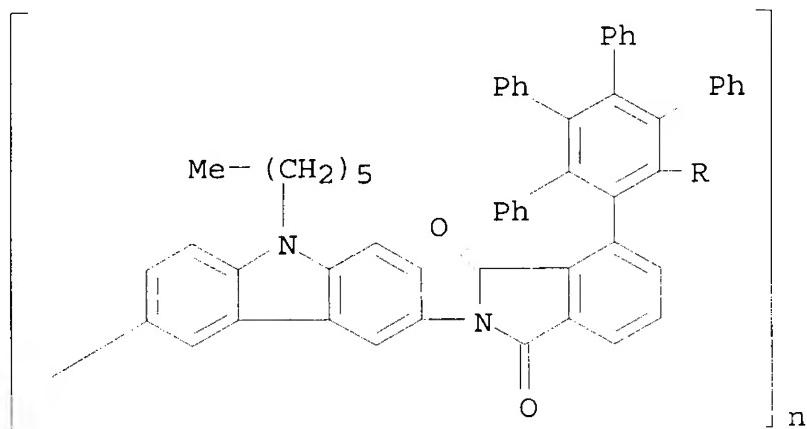
AB A new class of dianhydrides can be prepd. by cross-coupling between di-Et 3-iodophthalate and benzene-1,4-diborionate ester or acetylene. The acetylenic tetraester is an efficient dienophile in 4 + 2 cycloaddn. with tetracyclone to give the polyphenylated tetraester. The polyphenylated dianhydride, when polymd. with a carbazole-based diamine, gave a novel sol. polyimide that exhibits excellent thermal properties.

IT **363602-04-4P**  
(prepn. and characterization of thermostable)

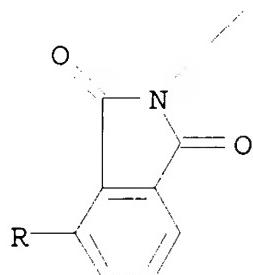
RN 363602-04-4 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)(1,3-dihydro-1,3-dioxo-2H-isoindole-2,4-diyl)(5',6'-diphenyl[1,1':2',1'''-terphenyl]-3',4'-diyl)(1,3-dihydro-1,3-dioxo-2H-isoindole-4,2-diyl)] (9CI) (CA INDEX NAME)

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PAGE 2-A



IT 363602-04-4P  
 (prepn. and characterization of thermostable)

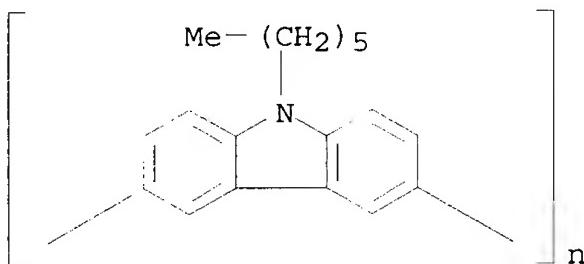
L44 ANSWER 6 OF 27 ZCA COPYRIGHT 2003 ACS

135:242592 Optical and electrochemical properties of soluble N-hexylcarbazole-co-3,4-ethylenedioxothiophene copolymers. Beouch, L.; Tran Van, F.; Stephan, O.; Vial, J. C.; Chevrot, C. (Equipe Reactivite aux Interfaces (EA 2528), Laboratoire sur les Polymères et les Matériaux Electroactifs, Université de Cergy Pontoise, Cergy Pontoise, 95013, Fr.). Synthetic Metals, 122(2), 351-358 (English) 2001. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB Sol. N-hexylcarbazole-co-3,4-ethylenedioxothiophene (HCz-co-EDOT) copolymers from mixts. in various ratio of the two corresponding dihalogenated monomers were synthesized. The random copolymers were obtained from EDOT/HCz starting molar ratio: 0.25, 1, 4, named, resp., C1, C2 and C3, and compared their properties to the two homopolymers synthesized in the same way. The IR studies clearly indicated, that an increase in the amt. of ethylenedioxothiophene in the feed compn. leads to an increase of the proportion of the corresponding comonomer in the final materials. Elemental anal. point out that the reactivity of dibrominated EDOT seems slightly lower than that of dibrominated HCz. Thin films of copolymer have been prep'd. and their electrochem. response have been investigated. Absorption and luminescence of these materials have been also studied in CHCl<sub>3</sub>. Copolymers mainly composed of one monomer (C1 and C3) behaves like the corresponding homopolymers. On an other hand, copolymer (C2) obtained from an equimolar amt. of each monomer in the feed compn. clearly exhibits distinct signals in optical spectra and in electrochem. behavior, probably due to the presence of each monomer unit short segments. The use of C2 has been explored for possible application in light emitting devices indicating that the p-doping of the material would be facilitated leading to an improved hole injecting when compared to carbazole homopolymer. It could be particularly interesting as a hole transporting layer in multilayer org. light emitting devices.

IT 359829-17-7P, Poly(9-hexyl-9H-carbazole-3,6-diyl)  
 (optical and electrochem. properties of sol. N-hexylcarbazole-co-

RN 3,4-ethylenedioxythiophene copolymers)  
 359829-17-7 ZCA  
 CN Poly(9-hexyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



IT 359829-17-7P, Poly(9-hexyl-9H-carbazole-3,6-diyl)  
 (optical and electrochem. properties of sol. N-hexylcarbazole-co-  
 3,4-ethylenedioxythiophene copolymers)

L44 ANSWER 7 OF 27 ZCA COPYRIGHT 2003 ACS

135:167387 Blue-Light-Emitting Fluorene-Based Polymers with Tunable Electronic Properties. Liu, Bin; Yu, Wang-Lin; Lai, Yee-Hing; Huang, Wei (Institute of Materials Research and Engineering (IMRE), National University of Singapore, Singapore, 117602, Singapore). Chemistry of Materials, 13(6), 1984-1991 (English) 2001. CODEN: CMATEX. ISSN: 0897-4756. Publisher: American Chemical Society.

AB A series of sol. alternating polyfluorene copolymers with different main chain structures and those of the same main chain structure polyfluorene-co-alt-phenylene with different functional groups attached at the 2- and/or 5-positions of the phenylene ring were synthesized by a palladium-catalyzed Suzuki coupling reaction. All 10 polymers had the band gaps ranging from 2.81 to 3.35 eV, corresponding to blue-light emission. Through controllable modification for both the main chain structures and the side chains, not only the optical and electronic properties of the blue emissive polymers had been tuned, but also the structure-property relationships, esp. the HOMO and LUMO energy level engineering, had been studied. Relatively high PL efficiency in both soln. and film states, good thermal stability, and relatively high glass transition temps. were demonstrated on these polymers. In general, polymers with the main chain structure of polyfluorene-co-alt-phenylene were found to have higher  $\Phi_{fl}$  both in soln. and in solid states than those copolymers with other main chain structures. For the polymers with the same main chain structure of polyfluorene-co-alt-phenylene, attachment of electron-donating alkoxy groups on phenylene ring had caused a spectral red shift, corresponding to slightly decreased HOMO and increased LUMO energy levels, while attachment of electron-withdrawing ester groups had led to an obvious blue shift in the absorption spectrum with a decrement in both the HOMO and LUMO energy levels as compared to that of the unsubstituted polymer. As for the polymers of different main chain structures, in comparison with poly(9,9-dihexylfluorene), carbazole comonomer had caused an obvious spectral blue shift with increased HOMO and

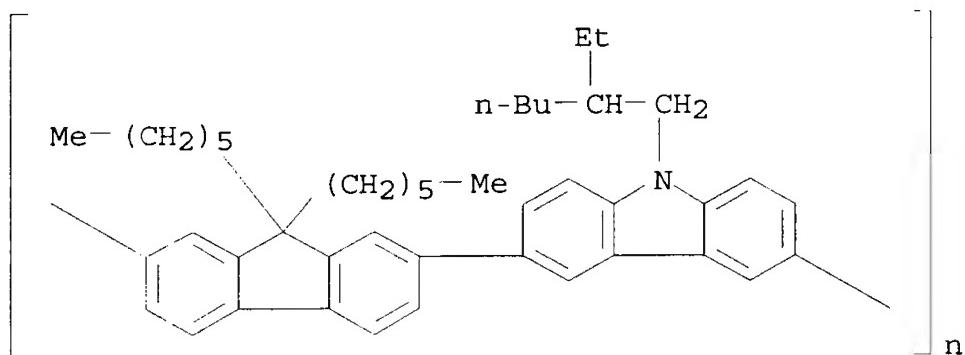
decreased LUMO energy levels. A decrement in both the HOMO and LUMO energy levels had been obsd. for poly[2,7-(9,9-dihexylfluorene)-co-1,4-naphthalene] in which naphthalene was chosen as the comonomer. However, for poly[2,7-(9,9-dihexylfluorene)-co-2,5-pyridine], although there was no obvious difference between the absorption and emission spectra of poly[2,7-(9,9-dihexylfluorene)-co-2,5-pyridine] as compared to those of poly(9,9-dihexylfluorene), both the HOMO and LUMO energy levels were reduced greatly when they were compared with those of poly(9,9-dihexylfluorene).

IT 353246-74-9P

(prepn. of blue-light-emitting fluorene-based polymers with tunable electronic properties)

RN 353246-74-9 ZCA

CN Poly[(9-(2-ethylhexyl)-9H-carbazole-3,6-diyl)(9,9-dihexyl-9H-fluorene-2,7-diyl)] (9CI) (CA INDEX NAME)



IT 353246-74-9P

(prepn. of blue-light-emitting fluorene-based polymers with tunable electronic properties)

L44 ANSWER 8 OF 27 ZCA COPYRIGHT 2003 ACS

135:107660 Preparation of poly(9-alkylcarbazole-3,6-diyl)s via palladium catalyzed cross-coupling reactions. Iraqi, A.; Waturu, I. (School of Physics &amp; Chemistry, University of Lancaster, Lancaster, LA1 4YA, UK). Synthetic Metals, 119(1-3), 159-160 (English). 2001. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB A new synthetic route for the prepn. of poly(9-alkylcarbazole-3,6-diyls) has been developed. It relies on Pd catalyzed cross-coupling polymn. of Grignard derivs. of 9-alkyl-3,6-dihalocarbazoles (halogen Br, I). The synthesis and characterization of a series of these carbazole monomers and corresponding polymers is presented. The nature of halogen groups on the 9-alkyl-3,6-dihalocarbazole monomers and the steric effects of alkyl group substituents on the polymn. are discussed.

IT 151173-03-4P, Poly(9-dodecyl-9H-carbazole-3,6-diyl)

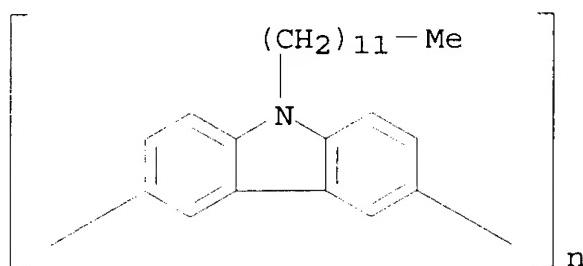
350474-32-7P 350474-37-2P 350474-43-0P,

Poly(9-hexadecyl-9H-carbazole-3,6-diyl)

(prepn. of poly(9-alkylcarbazole-3,6-diyl)s via palladium catalyzed cross-coupling reactions)

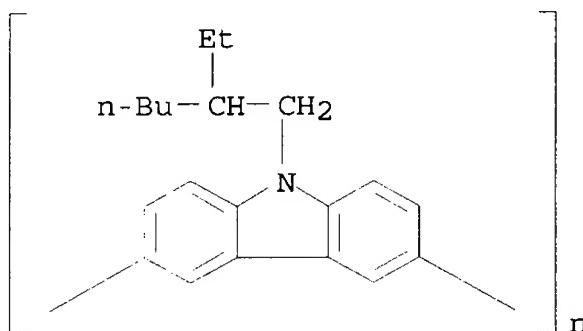
RN 151173-03-4 ZCA

CN Poly(9-dodecyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



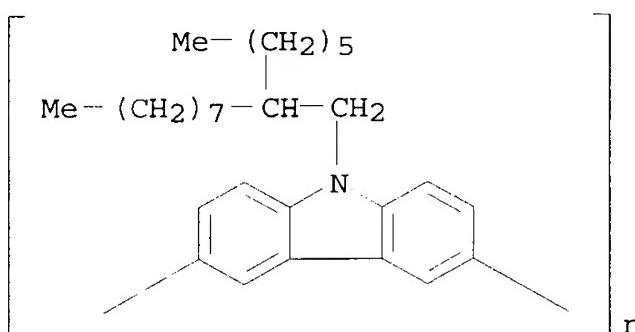
RN 350474-32-7 ZCA

CN Poly[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl] (9CI) (CA INDEX NAME)



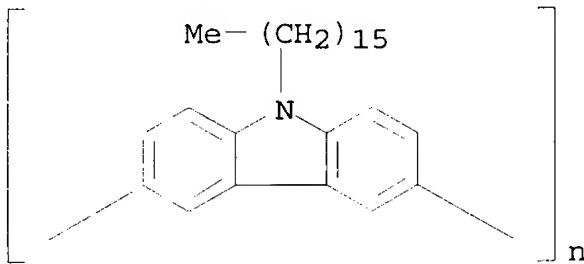
RN 350474-37-2 ZCA

CN Poly[9-(2-hexyldecyl)-9H-carbazole-3,6-diyl] (9CI) (CA INDEX NAME)



RN 350474-43-0 ZCA

CN Poly(9-hexadecyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



IT 151173-03-4P, Poly(9-dodecyl-9H-carbazole-3,6-diyl)  
 350474-32-7P 350474-37-2P 350474-43-0P,  
 Poly(9-hexadecyl-9H-carbazole-3,6-diyl)  
 (prepn. of poly(9-alkylcarbazole-3,6-diyl)s via palladium  
 catalyzed cross-coupling reactions)

L44 ANSWER 9 OF 27 ZCA COPYRIGHT 2003 ACS

135:5920 Synthesis and Electrochemical and Optical Properties of Novel Poly(aryl ether)s with Isolated Carbazole and p-Quaterphenyl Chromophores. Hwang, Shiao-Wen; Chen, Yun (Department of Chemical Engineering, National Cheng Kung University, Tainan, Taiwan). Macromolecules, 34(9), 2981-2986 (English) 2001. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

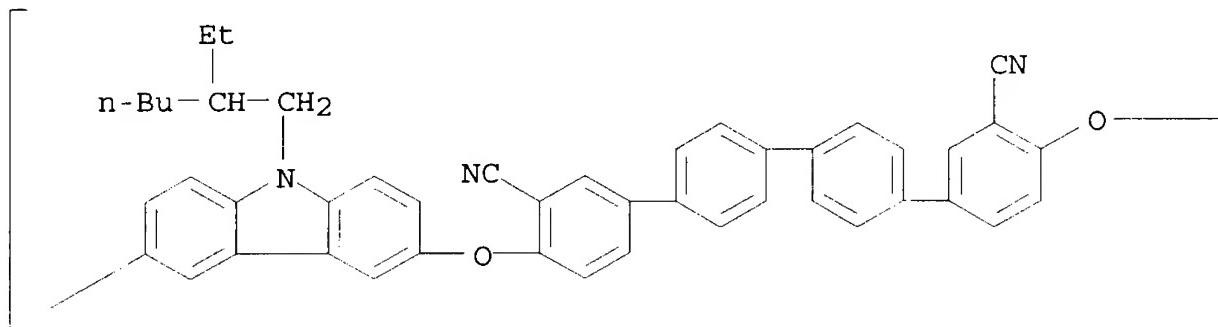
AB Two poly(aryl ether)s consisting of alternate isolated chromophores, poly[oxy-[9-(2-ethylhexyl)carbazole-3,6-oxy]-3,3'''-dicyano-p-quaterphenyl-4,4'''-ylene] (PCNCA) and poly[oxy-[9-(2-ethylhexyl)carbazole-3,6-oxy]-3,3'''-bis(trifluoromethyl)p-quaterphenyl-4,4'''-ylene] (PCFCA), were synthesized and characterized. The synthesized polymers are completely sol. in common org. solvents such as THF and chloroform. The two poly(aryl ether)s exhibit good thermal stability with 5% wt. loss above 400.degree. in nitrogen. The UV/vis and photoluminescent spectra of the polymers show max. peaks at around 318-319 and 407-413 nm in the film state, resp. The HOMO and LUMO energy levels of these polymers, which were measured by cyclic voltammetry, are -5.23, -3.25 eV for PCNCA and -5.41, -3.32 eV for PCFCA. The p-quaterphenyl segments are regarded as electron transporting units because the electron withdrawing substitutes (cyano and trifluoromethyl) enhance the electron affinity. The carbazole segments act as hole transporting units. The two units may lower the barrier of charge injection from opposite electrodes. Furthermore, all of the two units are emissive chromophores and contribute to the photoluminescence. The relative quantum yield of PCNA and PCFCA is 0.02, 0.40, resp., in film state, and 0.04, 0.19, resp., in THF.

IT 341036-60-0P 341036-62-2P  
 (prepn. and redox potential and luminescence and band gap energy of poly(aryl ether)s with isolated carbazole and p-quaterphenyl chromophore segments)

RN 341036-60-0 ZCA  
 Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]oxy(3,3'''-

dicyano[1,1':4',1'':4''],1''''-quaterphenyl]-4,4''''-diyl)oxy] (9CI)  
(CA INDEX NAME)

PAGE 1-A

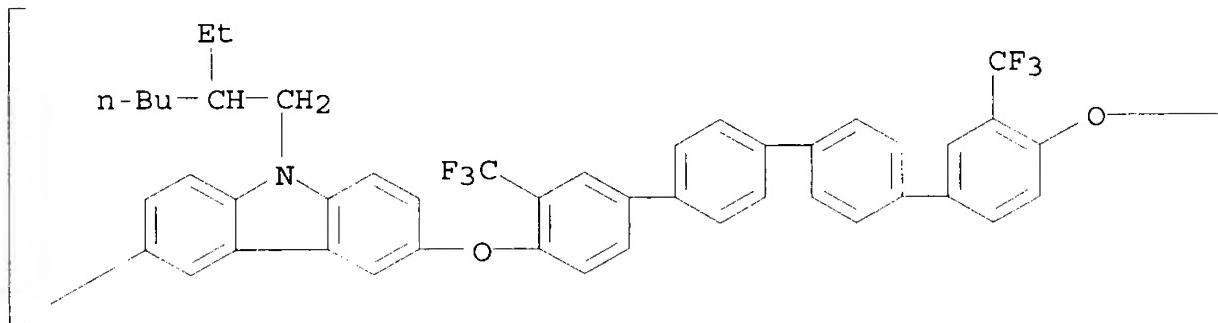


PAGE 1-B

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RN 341036-62-2 ZCA  
CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]oxy[3,3'''-  
bis(trifluoromethyl)[1,1':4',1'':4'',1'''-quaterphenyl]-4,4'''-  
diyl]oxy] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

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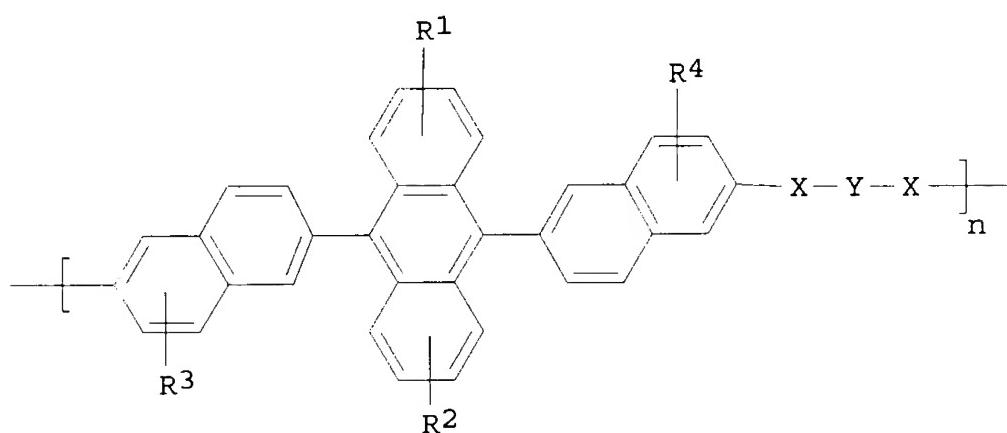
IT 341036-60-0P 341036-62-2P

(prepn. and redox potential and luminescence and band gap energy of poly(aryl ether)s with isolated carbazole and p-quaterphenyl chromophore segments)

L44 ANSWER 10 OF 27 ZCA COPYRIGHT 2003 ACS

134:346283 Electroluminescent devices having naphthalanthracene-based polymers. Shi, Jianmin; Zheng, Shiying (Eastman Kodak Company, USA). Eur. Pat. Appl. EP 1094101 A2 20010425, 56 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW.  
APPLICATION: EP 2000-203504 20001009. PRIORITY: US 1999-421980 19991020.

GI



AB Electroluminescent devices comprising an anode, a cathode, and polymer luminescent materials disposed between the anode and cathode are described in which the polymeric luminescent materials include

9,10-di-(2-naphthyl)anthracene-based polymers described by the general formula I (R1-4 = independently selected H, alkyl, C1-24 alkoxy, C6-28 (un)substituted aryl, C4-40 (un)substituted heteroaryl, F, Cl, Br, cyano, or nitro groups; X = a linking group; and Y includes .gtoreq.1 comonomer units that are (un)substituted alkyl, alkenyl, aryl, heteroaryl, or conjugated groups).

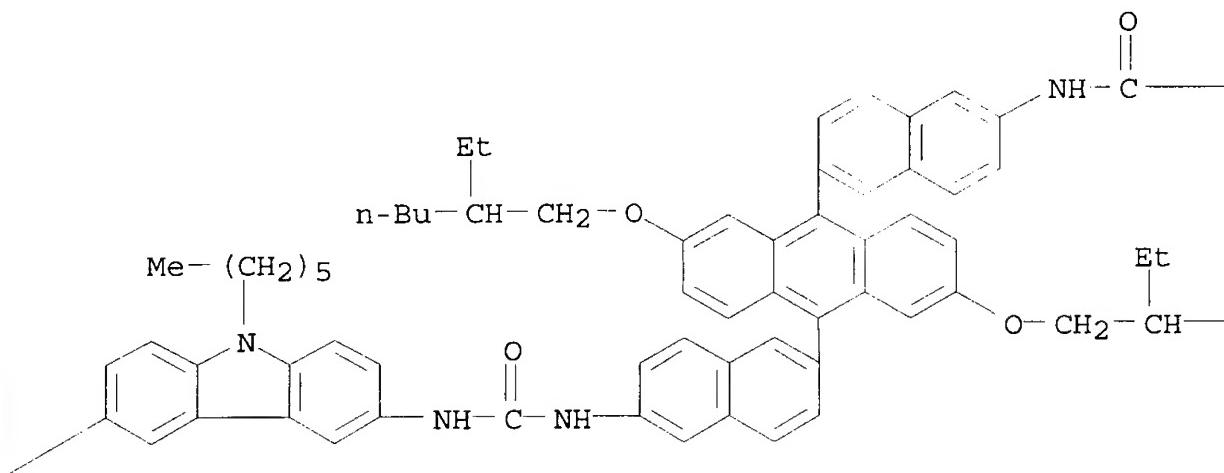
IT 337369-58-1 337369-61-6

(electroluminescent devices using naphthylanthracene-based polymers)

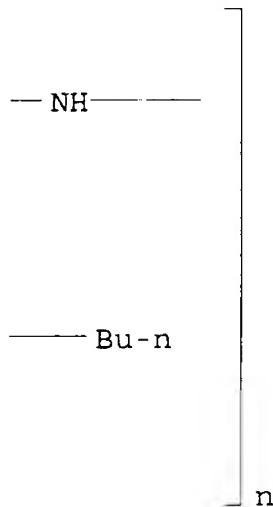
RN 337369-58-1 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)iminocarbonylimino-2,6-naphthalenediyl[2,6-bis[(2-ethylhexyl)oxy]-9,10-anthracenediyl]-2,6-naphthalenediyliminocarbonylimino] (9CI) (CA INDEX NAME)

PAGE 1-A



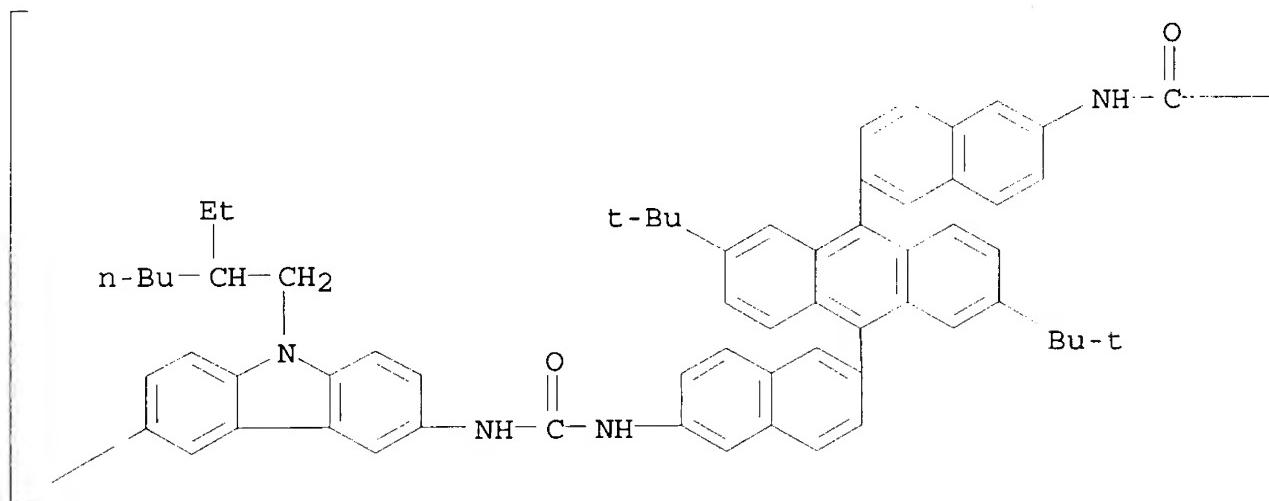
PAGE 1-B



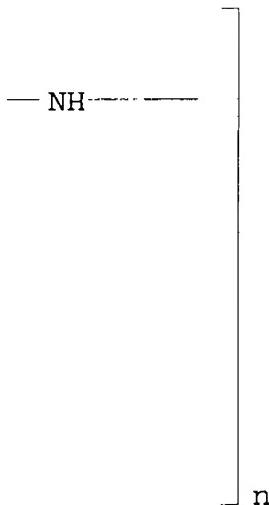
RN 337369-61-6 ZCA

CN Poly[[(9-(2-ethylhexyl)-9H-carbazole-3,6-diyl)iminocarbonylimino-2,6-naphthalenediyl[2,6-bis(1,1-dimethylethyl)-9,10-anthracenediyl]-2,6-naphthalenediyliminocarbonylimino] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



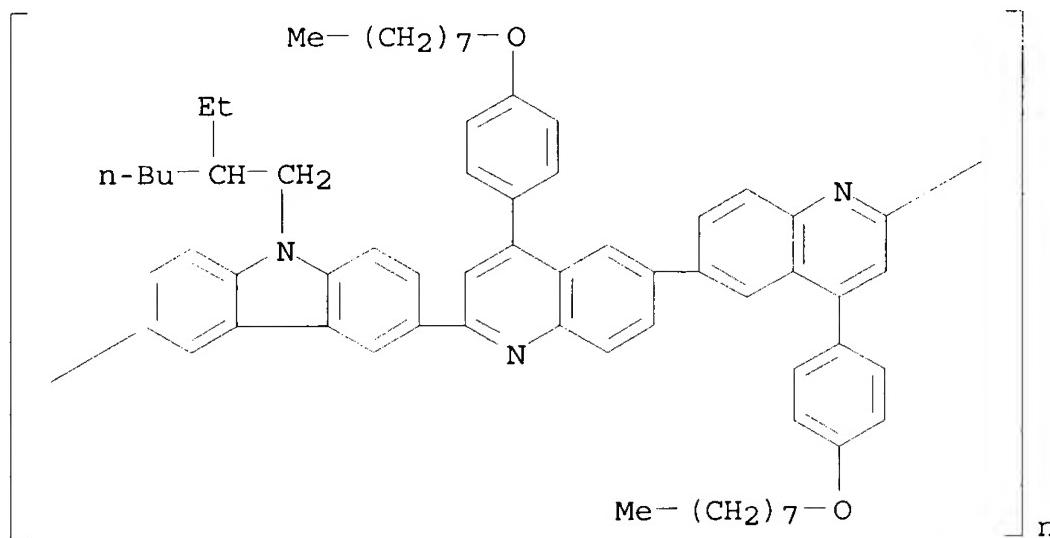
IT 337369-58-1 337369-61-6  
 (electroluminescent devices using naphthalanthracene-based polymers)

L44 ANSWER 11 OF 27 ZCA COPYRIGHT 2003 ACS  
 133:89897 Synthesis and light emitting properties of new polyquinolines with a pendent 4'-octyloxybiphenyl group. Kim, Jong Lae; Kim, Jai Kyeong; Cho, Hyun Nam; Kim, Dong Young; Hong, Sung Il (Department of Fiber & Polymer Science, Seoul National University, Seoul, 151-742, S. Korea). Macromolecular Chemistry and Physics, 201(7), 768-773 (English) 2000. CODEN: MCHPES. ISSN: 1022-1352. Publisher: Wiley-VCH Verlag GmbH.

AB Two novel AA-BB type polyquinolines with pendent 4'-octyloxybiphenyl groups (P1, P2) were synthesized successfully by the Friedlander polyquinoline synthesis and their thermal, luminescent and electrochem. properties were investigated. These polymers were sol. in convenient solvents and thermally stable showing initial decompn. temps. of >405.degree.. EL spectra of P1 and P2 lie in the green region (530 nm) and yellow region (574, 470 nm), resp. The turn on voltages of the diodes (ITO/polyquinoline/Al) were 19 V for P1 and 9 V for P2. The quantum efficiencies of these LEDs, with each polymer as the emissive layer, were 0.0076% and 0.0011% photons per electron, resp.

IT 280578-31-6P  
 (synthesis and light emitting properties of new polyquinolines with a pendent 4'-octyloxybiphenyl group)

RN 280578-31-6 ZCA  
 CN Poly[[4,4'-bis[4-(octyloxy)phenyl][6,6'-biquinoline]-2,2'-diyl][9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]] (9CI) (CA INDEX NAME)



IT 280578-31-6P

(synthesis and light emitting properties of new polyquinolines  
with a pendent 4'-octyloxybiphenyl group)

L44 ANSWER 12 OF 27 ZCA COPYRIGHT 2003 ACS

131:243697 Synthesis and characterization of a novel blue electroluminescent polymer constituted of alternating carbazole and aromatic oxadiazole units. Meng, Hong; Chen, Zhi-Kuan; Liu, Xiao-Ling; Lai, Yee-Hing; Chua, Soo-Jin; Huang, Wei (Institute of Materials Research and Engineering (IMRE), National University of Singapore, Singapore). *Physical Chemistry Chemical Physics*, 1(13), 2123-2127 (English) 1999 CODEN: PBCPFO ISSN: 1463-9076

3123-3127 (English) 1999. CODEN: PPER

Publisher: Royal Society of Chemistry.  
AB A polymer contg. alternating carbazole and arylenebisoxadiazole units was prep'd. by polymg. 2,5-bis(octyloxy)terephthaloyl hydrazide with 9-(2-ethylhexyl)-3,6-carbazoledicarbonyl chloride followed by cyclodehydration. The structure of the polymer was confirmed by FTIR, NMR, and elemental anal. The polymer is partially sol. in THF, CHCl<sub>3</sub>, xylene, and DMSO, and completely sol. in CHCl<sub>3</sub> contg. a small amt. TFA. The optical and electronic properties of the polymer were investigated by UV-visible absorption and photoluminescence spectroscopy as well as cyclic voltammetry. The polymer films emit greenish-blue light (475 nm). The bandgap energy of the polymer was estd. optically (2.82 eV) and electrochem. (2.94 eV). Both p-doping and n-doping processes are obsd. in cyclic voltammetric investigations. The HOMO and LUMO energies of the polymer were estd. to be 5.60 and 2.66 eV, resp. The photophys. and electronic properties as well as the preliminary electroluminescent device result of the polymer demonstrate that it is a promising candidate material for the fabrication of a polymer light-emitting device.

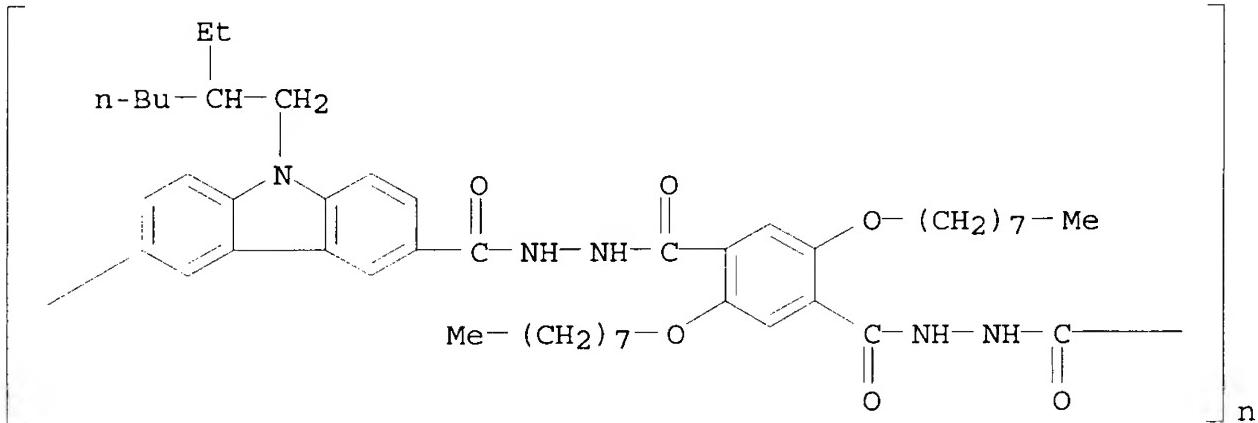
IT 244036-30-4P, 2,5-Bis(octyloxy)terephthaloyl

hydrazide-N-(2-ethylhexyl)-3,6-carbazoledicarbonyl chloride copolymer sru

(prepn. and cyclodehydration of)

RN 244036-30-4 ZCA

CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]carbonylhydrazocarbonyl[2,5-bis(octyloxy)-1,4-phenylene]carbonylhydrazocarbonyl] (9CI) (CA INDEX NAME)

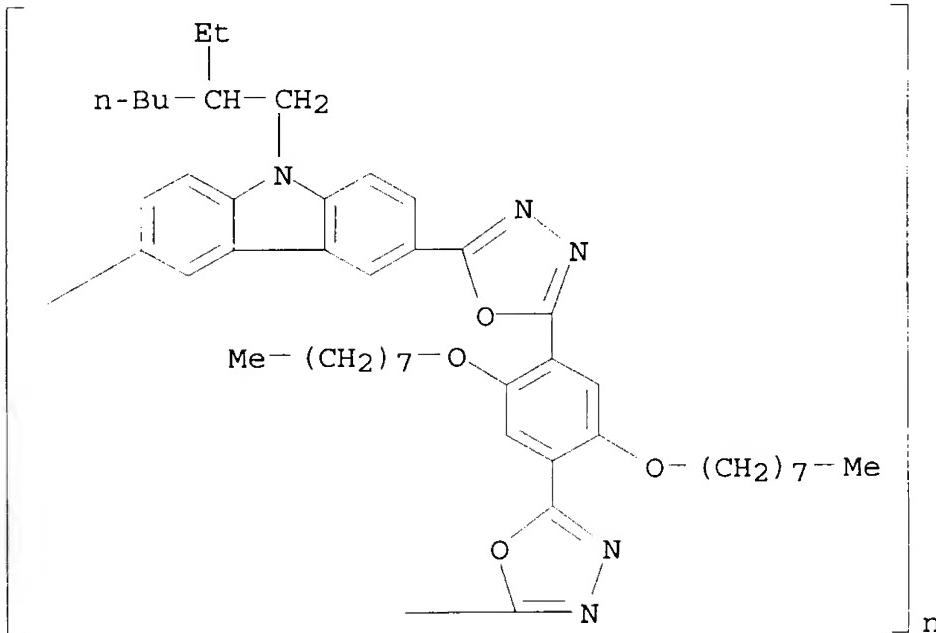


IT 244036-31-5P

(prepn. and properties of)

RN 244036-31-5 ZCA

CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]-1,3,4-oxadiazole-2,5-diyl[2,5-bis(octyloxy)-1,4-phenylene]-1,3,4-oxadiazole-2,5-diyl] (9CI) (CA INDEX NAME)



- IT **244036-30-4P**, 2,5-Bis(octyloxy)terephthaloyl  
hydrazide-N-(2-ethylhexyl)-3,6-carbazoledicarbonyl chloride  
copolymer sru  
(prepn. and cyclodehydration of)
- IT **244036-31-5P**  
(prepn. and properties of)

L44 ANSWER 13 OF 27 ZCA COPYRIGHT 2003 ACS

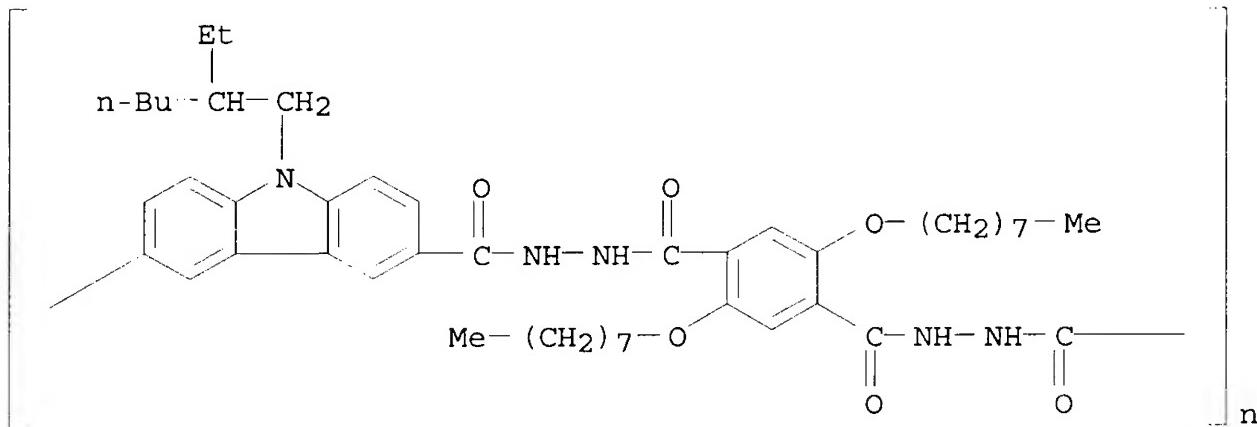
131:229257 Spectroscopic and Electrochemical Study of a Novel Blue  
Electroluminescent p-n Diblock Conjugated Copolymer. Meng, Hong;  
Chen, Zhi-Kuan; Huang, Wei (Institute of Materials Research and  
Engineering (IMRE), National University of Singapore, Singapore,  
119260, Singapore). Journal of Physical Chemistry B, 103(31),  
6429-6433 (English) 1999. CODEN: JPCBFK. ISSN: 1089-5647.  
Publisher: American Chemical Society.

AB A novel p-n diblock copolymer, poly[N-(2'-ethylhexyl)-carbazole-3,6-  
diyl-1'',3'',4''-oxadiazole-2'',5''-diyl-2''',5'''-dioctyloxy-  
1''',4'''-phenylene-1''',3''',4''''-oxadiazole-2''',5''''-diyl]  
(PCOPO) composed of an electron-rich moiety carbazole and an  
electron-deficient unit arom. oxadiazole was synthesized aiming at  
balancing the abilities of conducting holes and electrons.  
Electrochem. analyses by cyclic voltammetry indicate that PCOPO can  
be reversibly n-doped and irreversibly p-doped. The cathodic sweep  
reveals that the redn. involves two-electron process with respect to  
the successive redn. of oxadiazole rings and carbazole moieties in  
the polymer chain. The highest occupied MOs (HOMO) and lowest  
unoccupied MOs (LUMO) energy levels of the polymer are estd. to be  
5.60 and 2.66 eV from the onset of oxidn. and redn. potentials,  
resp. The band gap energy of the polymer estd. by the electrochem.  
measurement (2.94 eV) is in good agreement with that from the  
optical method (2.82 eV). The photoluminescence (PL) of film  
samples shows that the polymer emits greenish-blue light (475 nm).  
The PL of solns. is concn.-dependent. In dil. solns., the PL  
emission is from the singlet exciton transition, whereas in the  
concd. solns., it is mainly originated from excimers. The excimer  
formation is related to the incorporation of oxadiazole rings into  
the polymer backbone, which can enhance the interchain interactions.  
Both photophys. and electronic properties demonstrate that the  
polymer may be a promising candidate material for the fabrication of  
an efficient blue light-emitting device.

IT **244036-30-4P**  
(pre-polymer; spectroscopic and electrochem. study of a novel  
blue electroluminescent p-n conjugated copolymer)

RN 244036-30-4 ZCA

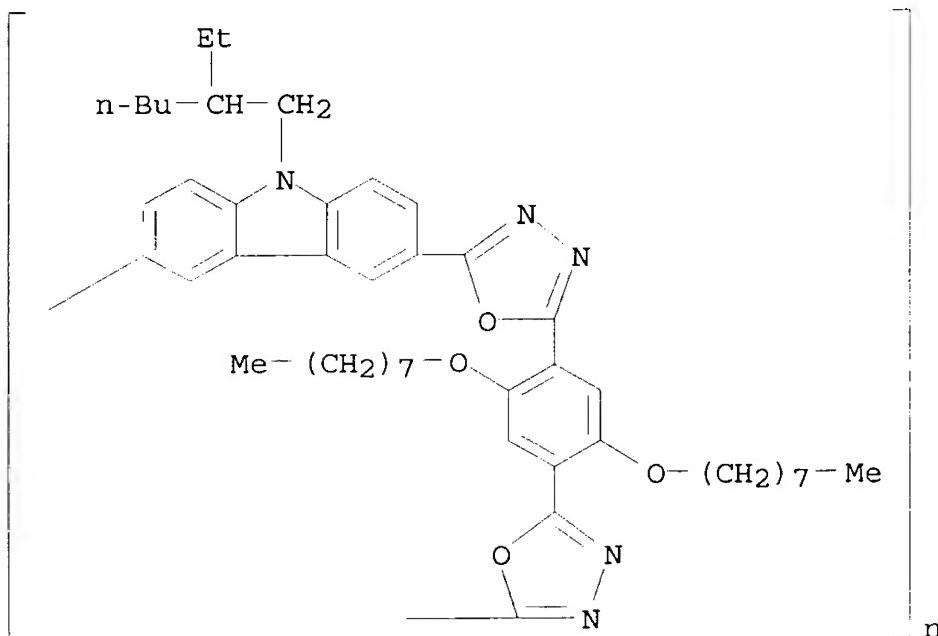
CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-  
diyl]carbonylhydrazocarbonyl[2,5-bis(octyloxy)-1,4-  
phenylene]carbonylhydrazocarbonyl] (9CI) (CA INDEX NAME)



IT 244036-31-5P

(spectroscopic and electrochem. study of a novel blue electroluminescent p-n conjugated copolymer)

RN 244036-31-5 ZCA

CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]-1,3,4-oxadiazole-2,5-diyl[2,5-bis(octyloxy)-1,4-phenylene]-1,3,4-oxadiazole-2,5-diyl]  
(9CI) (CA INDEX NAME)

IT 244036-30-4P

(pre-polymer; spectroscopic and electrochem. study of a novel blue electroluminescent p-n conjugated copolymer)

IT 244036-31-5P

(spectroscopic and electrochem. study of a novel blue

electroluminescent p-n conjugated copolymer)

L44 ANSWER 14 OF 27 ZCA COPYRIGHT 2003 ACS

130:168722 Synthesis and properties of photorefractive polyimine with carbazole unit. Woo, Han Young; Lee, Kwang-Sup; Shim, Hong-Ku; Kim, Bong-Ki; Rhee, Bum Ku (Department of Chemistry, Korea Advanced Institute of Science and Technology, Taejon, 305-701, S. Korea). Proceedings of SPIE-The International Society for Optical Engineering, 3471(Xerographic Photoreceptors and Organic Photorefractive Materials IV), 142-151 (English) 1998. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB A new fully functionalized photorefractive polyimine was prep'd. by the condensation polymn. between a photoconducting carbazole deriv., 9-(2-ethylhexyl)carbazole-3,6-dicarbaldehyde, and a nonlinear optical stilbene chromophore, 4-[N,N-bis(2-aminoethyl)amino]-4'-nitrostilbene. The polyimine showed excellent solv. in common org. solvents such as chloroform, cyclohexanone, THF, etc. and high optical quality films were obtained by free standing film casting. Very high second order optical nonlinearity with  $d_{33} = 120 \text{ pm/V}$  was obsd. by second harmonic generation at the fundamental 1064 nm wavelength. The polymer demonstrated good thermal stability of aligned dipoles up to ca. 125.degree.. A diffraction grating was formed by the interference of two coherent beams from an Ar-ion laser operating at a wavelength of 488 nm. Holog. diffraction efficiency of about 15% has been achieved in a 10 .mu.m-thick film. Storage of the film showed a remarkably long stability at room temp.

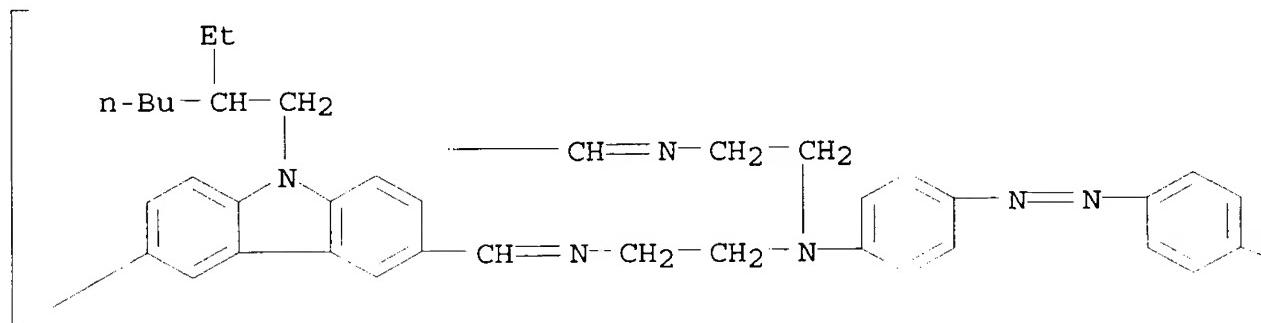
IT 220432-60-0P

(synthesis and properties of photorefractive polyamine contg. carbazole unit)

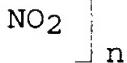
RN 220432-60-0 ZCA

CN Poly[[9-(2-ethylhexyl)-9H-carbazole-3,6-diyl]methylidynenitrilo-1,2-ethanediyl[[4-[(4-nitrophenyl)azo]phenyl]imino]-1,2-ethanediylnitrilomethylidyne] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IT 220432-60-0P

(synthesis and properties of photorefractive polyamine contg. carbazole unit)

L44 ANSWER 15 OF 27 ZCA COPYRIGHT 2003 ACS

129:122919 Polyesters from bicarbazyl in a chain and model compound: synthesis, electrochemical and electroluminescence properties.  
 Benazzi, T.; Ades, D.; Siove, A.; Romero, D.; Nuesch, F.; Zuppiroli, L. (Laboratoire de Recherches sur les Macromolecules, Institut Galilee, CNRS, Universite Paris-Nord, Villetaneuse, 93430, Fr.). Journal de Chimie Physique et de Physico-Chimie Biologique, 95(6), 1238-1241 (French) 1998. CODEN: JCPBAN. ISSN: 0021-7689.  
 Publisher: EDP Sciences.

AB Polyesters with bicarbazyl groups in the main chain were synthesized by a two-step polycondensation in bulk from 9,9'-dioctyl-[3,3'-bi-9H-carbazole]-6,6'-dicarbonyl chloride and ethylene glycol. Electrochem. and electroluminescence properties of the polyesters were studies and compared with those of model compds. of the repetitive unit. Electrochem. studies showed that the materials are electroactive and allowed the detn. of the optimal stability conditions. From the photo- and electroluminescence studies of both the polyesters and the model compds., a classification of the performances of the corresponding diodes was established. The best results were obtained with bicarbazyl (blue-light).

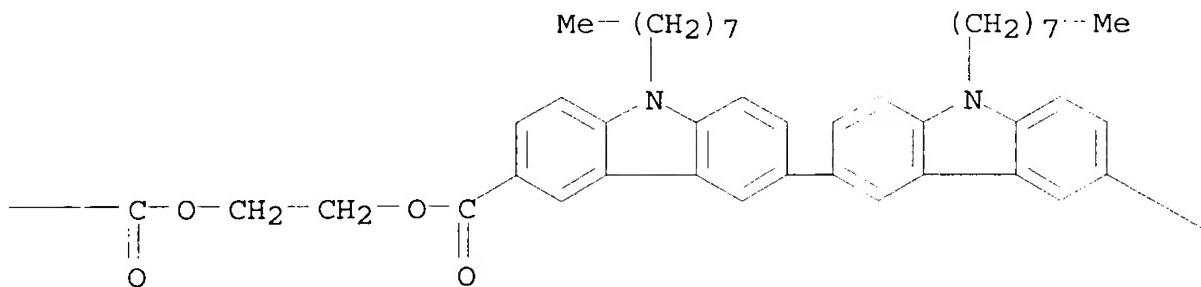
IT 210344-74-4P

(prepn. and electrochem. and electroluminescence properties of bicarbazole-contg. polyesters)

RN 210344-74-4 ZCA

CN Poly[(9,9'-dioctyl[3,3'-bi-9H-carbazole]-6,6'-diyl)carbonyloxy-1,2-ethanediyoxy carbonyl] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

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IT 210344-74-4P

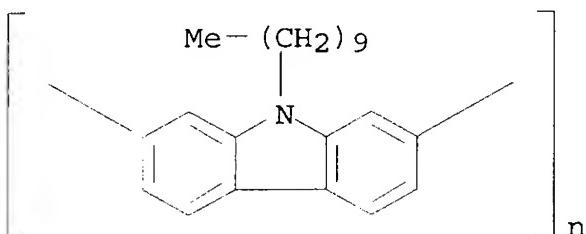
(prepn. and electrochem. and electroluminescence properties of  
bicarbazole-contg. polyesters)

L44 ANSWER 16 OF 27 ZCA COPYRIGHT 2003 ACS

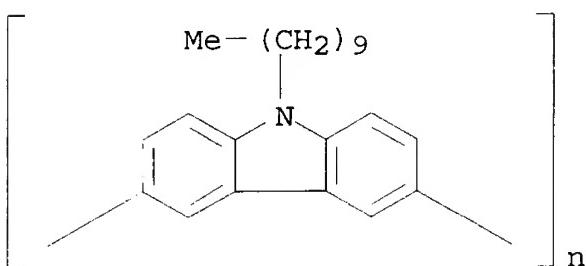
126:212647 Polyarylenes on the basis of alkylpyrrole and alkylcarbazole derivatives and their oligomeric model systems. Geissler, Uwe; Hallensleben, Manfred L.; Riener, Anke; Rohde, Nils (School of Natural and Environmental Sciences, Coventry University, Coventry, CV1 5FB, UK). Polymers for Advanced Technologies, 8(2), 87-92 (English) 1997. CODEN: PADTE5. ISSN: 1042-7147. Publisher: Wiley.

AB The redox and spectroscopic properties of sol. poly(9-decylcarbazole) derivs. and poly(1-decylpyrrole) were studied. The polymers were synthesized via the Yamamoto polycondensation method. Analyzing the electrochem. and optical properties of 3,6-linked poly(alkylcarbazole)s it is evident that the conjugation segment is the benzidine system and the overall properties of these polymers can be compared with meta linked poly(phenylene)s. In opposite, 2,7-linked poly(alkylcarbazole)s reveal an even longer conjugation segment comparable with para linked poly(phenylene)s. First observations in the case of poly(1-decylpyrrole) suggest a higher steric hindrance compared to poly(1-methylpyrrole). Mol. modeling

- IT studies confirm this.
- IT 188706-51-6, Poly(1-decyl-9H-carbazole-2,7-diyl)  
 188738-54-7, Poly(9-decyl-9H-carbazole-3,6-diyl)  
 (cyclic voltammetry and Raman spectroscopy of polyarylenes on basis of alkylpyrrole and alkylcarbazole derivs. and oligomeric model systems)
- RN 188706-51-6 ZCA  
 CN Poly(1-decyl-9H-carbazole-2,7-diyl) (9CI) (CA INDEX NAME)



- RN 188738-54-7 ZCA  
 CN Poly(9-decyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



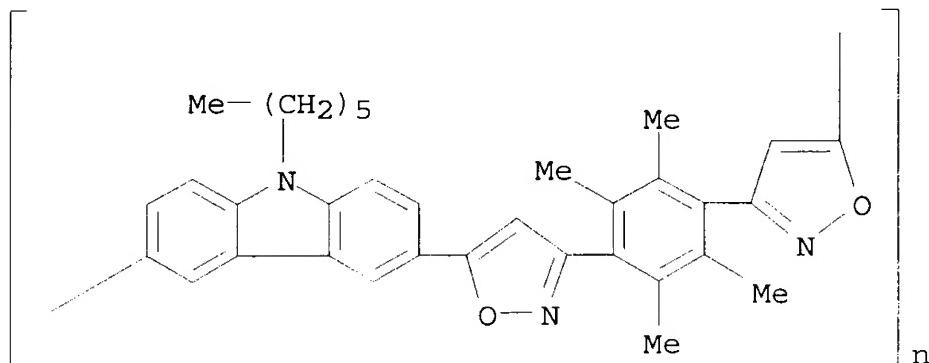
- IT 188706-51-6, Poly(1-decyl-9H-carbazole-2,7-diyl)  
 188738-54-7, Poly(9-decyl-9H-carbazole-3,6-diyl)  
 (cyclic voltammetry and Raman spectroscopy of polyarylenes on basis of alkylpyrrole and alkylcarbazole derivs. and oligomeric model systems)

- L44 ANSWER 17 OF 27 ZCA COPYRIGHT 2003 ACS  
 125:59318 Preparation of soluble and fluorescent poly(arylene)s by 1,3-dipolar polycycloaddition and properties of the polymers.  
 Kanbara, Takaki; Ishii, Takumi; Hasegawa, Kiyoshi; Yamamoto, Takakazu (Dep. Chemical and Biochem. Eng., Toyama Univ., Toyama, 930, Japan). Polymer Bulletin (Berlin), 36(6), 673-679 (English) 1996. CODEN: POBUDR. ISSN: 0170-0839. Publisher: Springer.
- AB 1,3-Dipolar polycycloaddns. of 2,3,5,6-tetramethylterephthalodinitri le oxide with 3,6-diethynyl-9-hexylcarbazole or 2,6-diethynylpyridine afforded novel sol. polyisoxazole poly(arylene)s. The polymers showed strong fluorescence in solns. as well as in cast films with peaks at 340-490 nm.
- IT 178278-40-5P  
 (prepn. of sol. polyisoxazoles by 1,3-dipolar polycycloaddn. of

dinitrile N-oxides)

RN 178278-40-5 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)-5,3-isoxazolediyl(2,3,5,6-tetramethyl-1,4-phenylene)-3,5-isoxazolediyl] (9CI) (CA INDEX NAME)



IT 178278-40-5P

(prepn. of sol. polyisoxazoles by 1,3-dipolar polycycloaddn. of dinitrile N-oxides)

L44 ANSWER 18 OF 27 ZCA COPYRIGHT 2003 ACS

123:183661 Functional thin film, production and application thereof.  
Saji, Tetsuo (Dainichiseika Color Chem, Japan; Saji Tetsuo). Jpn. Kokai Tokkyo Koho JP 07062594 A2 19950307 Heisei, 41 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-234301 19930827.

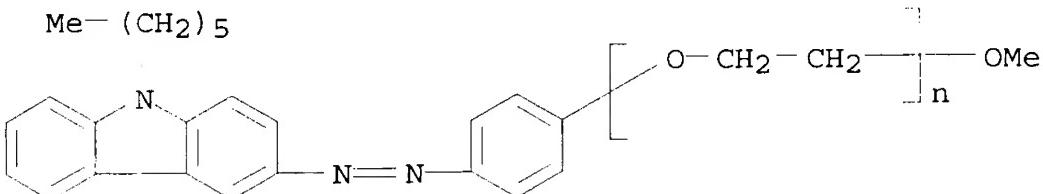
AB The title film, useful for a color filter, electrophotog. device, photosensor, solar cell, electroluminescence device, optical recording device, optical nonlinear device, optoelectronic device, photochromic film, electrochromic film, gas sensor and ion sensor, is prep'd. by an electrochem. redn. of a surfactant contg. an arom. azo residue, dispersed in a water or water contg. solvent. The title method requires min. or zero use of binder resin.

IT 167856-92-0

(functional thin film prep'd. by photochem. redn. of surfactant contg. arom. azo residue)

RN 167856-92-0 ZCA

CN Poly(oxy-1,2-ethanediyl), .alpha.-[4-[(9-hexyl-9H-carbazol-3-yl)azo]phenyl]-.omega.-methoxy- (9CI) (CA INDEX NAME)



IT 167856-92-0

(functional thin film prep'd. by photochem. redn. of surfactant

contg. arom. azo residue)

L44 ANSWER 19 OF 27 ZCA COPYRIGHT 2003 ACS

119:250891 Thermal transitions in poly (N-alkyl-3,6-carbazolylenes).

Siove, A.; Belorgey, G. (Lab. Rech. Macromol., Univ. Paris-Nord, Villetaneuse, F-93430, Fr.). Polymer Bulletin (Berlin, Germany), 31(1), 105-110 (English) 1993. CODEN: POBUDR. ISSN: 0170-0839.

AB Thermal transitions of poly(N-alkyl-3,6-carbazolylenes) were analyzed by DSC. Glass transition temps. of the polymers decreased by increasing side-chain length. As-prepd. polymers bearing n-octyl pendent groups exhibit crystallinity but no crystn. from the melt was obsd. Recrystn. of the samples thermally treated was obtained by solvent treatment. Crystallinity was assocd. to an ordered phase involving the main-chain units.

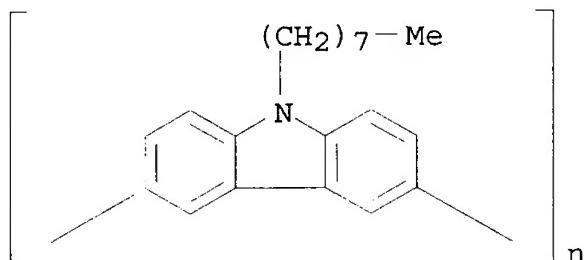
IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)

151173-03-4, Poly(9-dodecyl-9H-carbazole-3,6-diyl)

151173-04-5, Poly(9-octadecyl-9H-carbazole-3,6-diyl)  
(thermal transitions in)

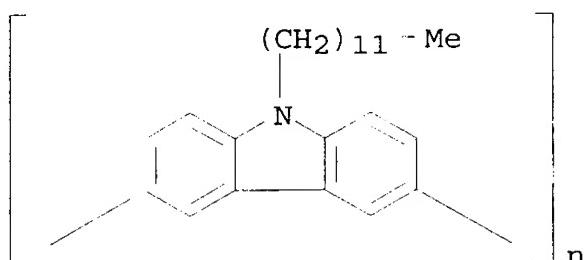
RN 121624-04-2 ZCA

CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



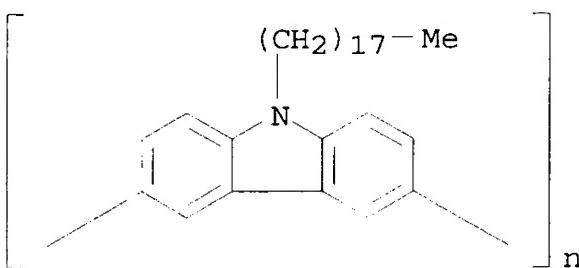
RN 151173-03-4 ZCA

CN Poly(9-dodecyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



RN 151173-04-5 ZCA

CN Poly(9-octadecyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 151173-03-4, Poly(9-dodecyl-9H-carbazole-3,6-diyl)  
 151173-04-5, Poly(9-octadecyl-9H-carbazole-3,6-diyl)  
 (thermal transitions in)

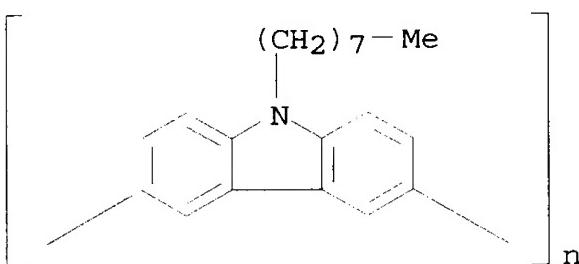
L44 ANSWER 20 OF 27 ZCA COPYRIGHT 2003 ACS  
 119:181323 Investigation of the electrocatalyzed step polymerization of soluble electroactive poly(N-alkyl-3,6-carbazolylenes). Faid, Karim; Siove, Alain; Ades, Dominique; Chevrot, Claude (Lab. Rech. Macromol., Univ. Paris-Nord, Villejuif, 93430, Fr.). Synthetic Metals, 55(2-3), 1656-61 (English) 1993. CODEN: SYMEDZ. ISSN: 0379-6779.

AB Simultaneous gel-phase chromatog. and cyclic voltammetry measurements are carried out in the course of the electrocatalyzed polymn. of 3,6-dibromo-N-alkylcarbazoles (alkyl = Bu, octyl). The evolution of the mol.-wt. distribution as a function of the electrolysis time reveals a step polymn. process, while showing a termination of the chain growth due to the occurrence of monobrominated species. The consumption of the Ni catalytic species corresponds in a first step to an increase in the chain length, while after given periods there is no more chain growth related to the continuous consumption of the catalytic precursor. The study of the effect of the initial [monomer]/[catalyst] ratio on the mol.-wt. distribution evolution indicates that the coupling of Ni(0)-activated species is responsible for the chain growth.

IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 (prepn. of, by electrocatalyzed step polymn.)

RN 121624-04-2 ZCA

CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)



IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)

(prepn. of, by electrocatalyzed step polymn.)

L44 ANSWER 21 OF 27 ZCA COPYRIGHT 2003 ACS

118:102721 Soluble polyesters containing carbazole units in the main chain: synthesis, properties and chemical doping. Drzewinski, Isabel; Ades, Dominique; Siove, Alain (Lab. Rech. Macromol., Univ. Paris-Nord, Villetaneuse, 93430, Fr.). Makromolekulare Chemie, Rapid Communications, 13(12), 549-54 (English) 1992. CODEN: MCRCD4. ISSN: 0173-2803.

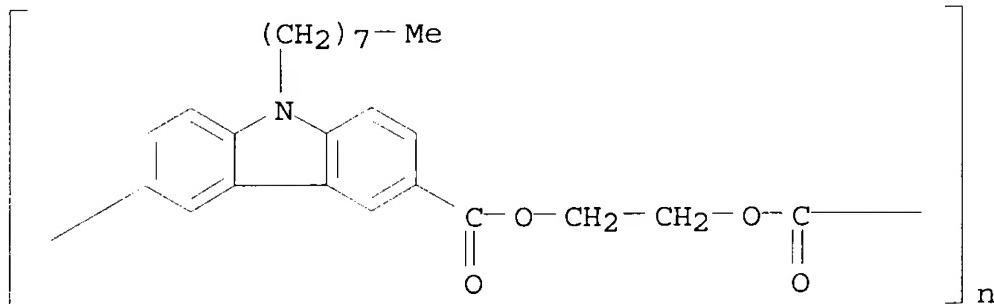
AB N-Octylcarbazole-3,6-dicarboxylic acid is prepd. and then polycondensed with ethylene glycol to form a polyester with carbazole groups in the main chain. The polyester is characterized. The polyester is then doped with I; elec. cond. is presented.

IT 145929-06-2P

(prepn. and characterization and elec. cond. of)

RN 145929-06-2 ZCA

CN Poly[(9-octyl-9H-carbazole-3,6-diyl)carbonyloxy-1,2-ethanediylloxycarbonyl] (9CI) (CA INDEX NAME)



IT 145929-06-2P

(prepn. and characterization and elec. cond. of)

L44 ANSWER 22 OF 27 ZCA COPYRIGHT 2003 ACS

114:31798 Chain length effect on the electroactivity of poly(N-alkyl-3,6-carbazolediyl) thin films. Siove, A.; Ades, D.; N'Gbilo, E.; Chevrot, C. (Lab. Rech. Macromol., Univ. Paris-Nord, Villetaneuse, 93430, Fr.). Synthetic Metals, 38(3), 331-40 (English) 1990. CODEN: SYMEDZ. ISSN: 0379-6779.

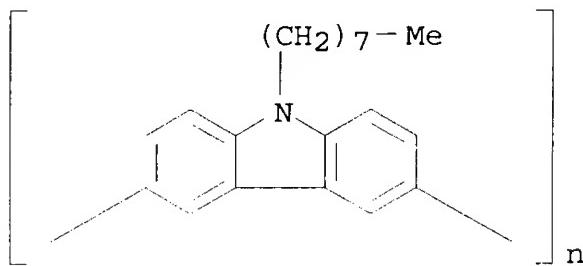
AB Several poly(N-alkyl-3,6-carbazolediyl)s (PCZS) have been obtained by electroredn. of the corresponding dibromomonomers in the presence of a catalytic Ni(0)-based system. Depending on the nature of the alkyl group linked to the nitrogen atom, PCZS are sol. in org. solvents such as nitrobenzene, chloroform and THF and insol. in acetonitrile and alcs. Taking these properties into account thin films have been prepd. (in the neutral state) either by casting from solns. or directly by electrodeposition onto conducting substrates in the CH<sub>3</sub>CN/NBu<sub>4</sub>BF<sub>4</sub> medium. Electrochem. behavior of these materials in the range 0-1.4 V vs. SCE (SCE) is strongly dependent on the macromol. chain length, but is slightly affected by the nature of the alkyl chain. Depending on the potential applied, the

films are either colorless, green or blue. The redox processes involved in electrochem. oxidn. of the polymer as well as those of the oligomers are discussed.

IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)  
(redox reactions of, electrochem., in org. solvent)

RN 121624-04-2 ZCA

CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)

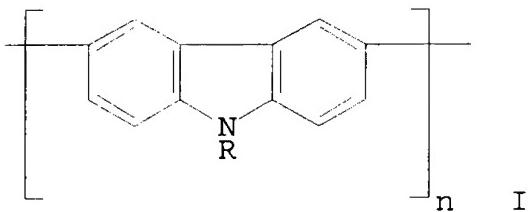


IT 121624-04-2, Poly(9-octyl-9H-carbazole-3,6-diyl)  
(redox reactions of, electrochem., in org. solvent)

L44 ANSWER 23 OF 27 ZCA COPYRIGHT 2003 ACS

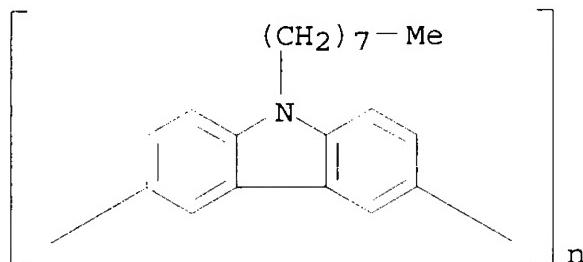
111:40172 Polymers of carbazole derivatives. Matsura, Akira; Okamoto, Akio (Denki Kagaku Kogyo K. K., Japan). Jpn. Kokai Tokkyo Koho JP 01011129 A2 19890113 Heisei, 7 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1987-166684 19870703.

GI



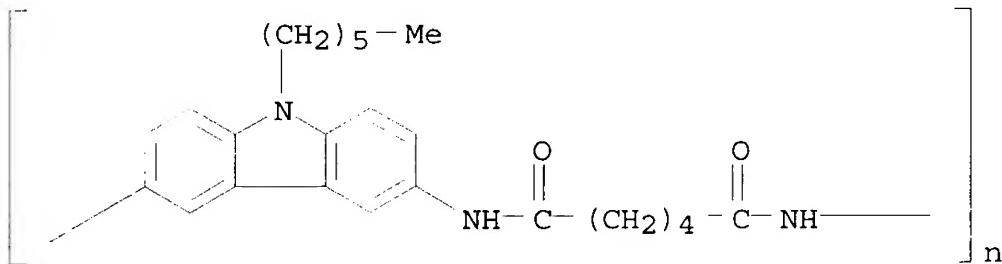
AB Title polymers I [R = C<sub>2</sub>-15 alkyl, (cycloalkyl- or aryl-substituted) alkyl, C<sub>5</sub>-7 cycloalkyl; n = 2-500], useful for elec. conductive and photoconductive materials, are prep'd. Thus, 10 g 3,6-dibromocarbazole was added slowly to a suspension of 1.48 g 60% NaH in 50 mL DMF, stirred at room temp. for 30 min, treated dropwise with a soln. of 6.5 mL n-octyl bromide in 30 mL DMF, and stirred at 70.degree. for 10 h to give 9.98 g N-n-octyl-3,6-dibromocarbazole (II). The Grignard reagent from 0.55 g Mg and 9.98 g II was refluxed with 50 mg dichloro(2,2'-bipyridyl)nickel in THF for 15 h, the mixt. was added to concd. HCl, filtered, washed with H<sub>2</sub>O, and dried to give 3.98 g poly(N-n-octylcarbazole) which was dissolved in CHCl<sub>3</sub>, cast on a glass plate, and dried to give a film with elec. cond. 10-13 S/cm.

IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 (prepn. of, for elec. conductors and photoconductors)  
 RN 121624-04-2 ZCA  
 CN Poly(9-octyl-9H-carbazole-3,6-diyl) (9CI) (CA INDEX NAME)

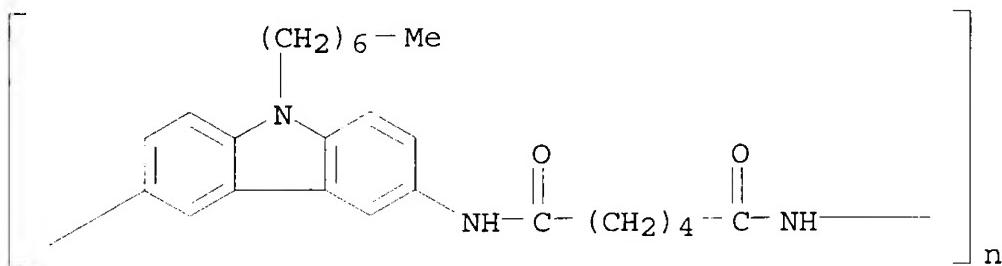


IT 121624-04-2P, Poly(9-octyl-9H-carbazole-3,6-diyl)  
 (prepn. of, for elec. conductors and photoconductors)

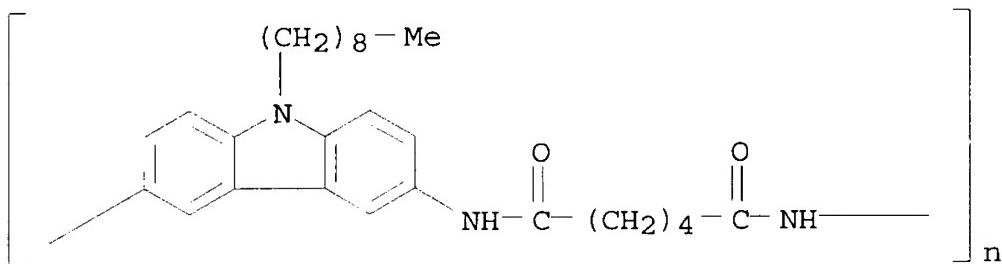
L44 ANSWER 24 OF 27 ZCA COPYRIGHT 2003 ACS  
 95:151198 Polyamides containing a carbazole system in the main chain.  
 Domanski, Andrzej; Pielichowski, Jan (Inst. Chem. Technol. Org.,  
 Politech. Krakowskiej, Krakow, Pol.). Zeszyty Naukowe - Wydzsa  
 Szkoła Pedagogiczna im. Powstanców Śląskich w Opolu: Chemia, 4,  
 5-37 (Polish) 1981. CODEN: ZWSCDK. ISSN: 0324-9034.  
 AB Nitration and redn. of carbazole [86-74-8] and its C2-16 9-alkyl  
 derivs. gave the corresponding 3,6-diaminocarbazoles which were  
 polycondensed with (HO2C)2(CH2)n (n = 0-8) and terephthalic acid.  
 Acylation of 9-ethylcarbazole (I) [86-28-2] with AcCl [75-36-5]  
 followed by bromoform reaction, and acylation of I with succinic  
 anhydride [108-30-5] gave 9-ethylcarbazole-3,6-dicarboxylic acid  
 [3215-45-0] and .gamma..gamma.'-[9-ethylcarbazole-3,6-  
 diyl]bis[.gamma..gamma.-ketobutyric acid] [79067-33-7], resp., which, and  
 their acid chloride derivs., were polycondensed with  
 hexamethylenediamine. The polycondensations were performed in the  
 melt, in soln., and interfacially. Melting temps., thermal  
 stability, solv., and mech. and dielec. properties of the resulting  
 polyamides (mol. wt. 11,200) were detd. as functions of  
 their structure and preparative method.  
 IT 58130-97-5P 58130-98-6P 58130-99-7P  
 58131-00-3P 58131-11-6P 58131-12-7P  
 (prepn. and properties of)  
 RN 58130-97-5 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-  
 hexanediyil)imino] (9CI) (CA INDEX NAME)



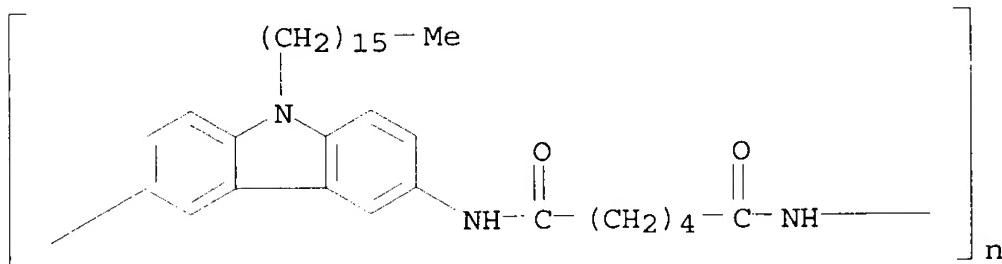
RN 58130-98-6 ZCA  
 CN Poly[(9-heptyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyi)imino] (9CI) (CA INDEX NAME)



RN 58130-99-7 ZCA  
 CN Poly[(9-nonyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyi)imino] (9CI) (CA INDEX NAME)

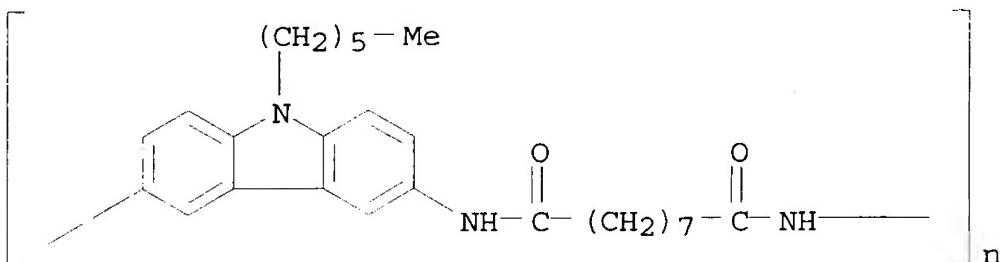


RN 58131-00-3 ZCA  
 CN Poly[(9-hexadecyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyi)imino] (9CI) (CA INDEX NAME)



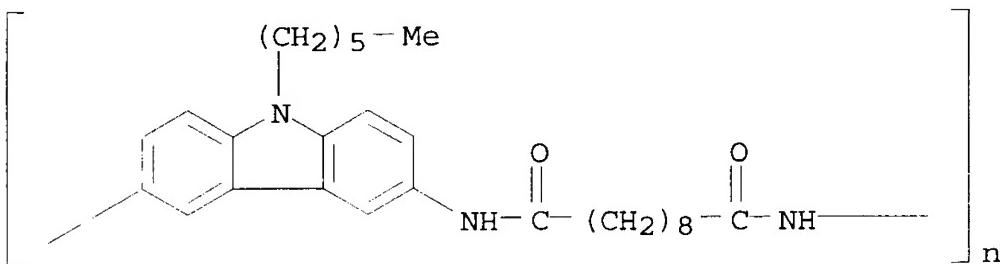
RN 58131-11-6 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,9-dioxo-1,9-nonenediyl)imino] (9CI) (CA INDEX NAME)



RN 58131-12-7 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,10-dioxo-1,10-decanediyl)imino] (9CI) (CA INDEX NAME)



IT 58130-97-5P 58130-98-6P 58130-99-7P

58131-00-3P 58131-11-6P 58131-12-7P

(prepn. and properties of)

L44 ANSWER 25 OF 27 ZCA COPYRIGHT 2003 ACS

86:90431 Thermal studies of polyamides based on 3,6-diamino-9-n-alkylcarbazoles and dicarboxylic acids. Pielichowski, J.; Domanski, A. (Inst. Org. Chem. Technol., Krakow, Pol.). Termanal '76, Celostatna Konf. Term. Anal., [Pr.], 7th, O-37-O-42. Slov. Chem. Spolocnost SAV: Bratislava, Czech. (English) 1976. CODEN: 34NNA5.

AB Thermal studies of 21 of the title polyamides of mol. wt. 1030-10540 showed that the most heat-resistant polymers were obtained with C<sub>2</sub>-C<sub>6</sub> alkyl groups on the carbazole ring. Polyamides prep'd. from C<sub>2</sub>-C<sub>10</sub> aliph. dicarboxylic acids were more heat-resistant than those prep'd. from terephthalic acid. The thermal curves were similar in all cases, with preliminary wt. loss occurring at 280-397.degree., depending on the polymer.

IT 58130-97-5 58130-98-6 58130-99-7

58131-00-3 58131-04-7 58131-05-8

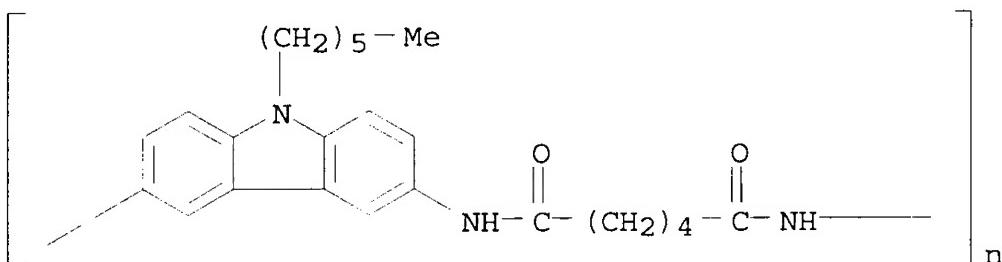
58131-06-9 58131-07-0 58131-11-6

58131-12-7

(thermal properties of, detn. of, by DTA)

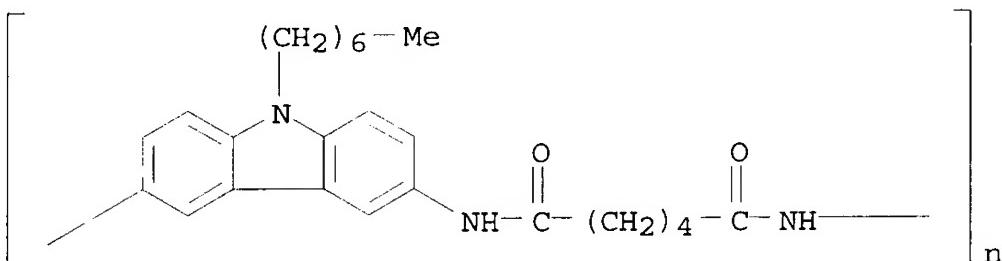
RN 58130-97-5 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyiyl)imino] (9CI) (CA INDEX NAME)



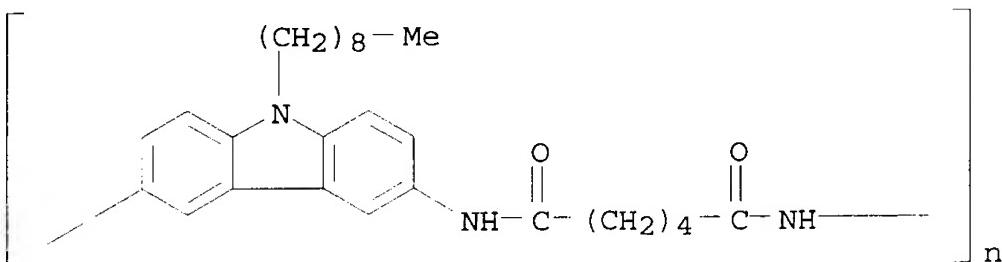
RN 58130-98-6 ZCA

CN Poly[(9-heptyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyiyl)imino] (9CI) (CA INDEX NAME)



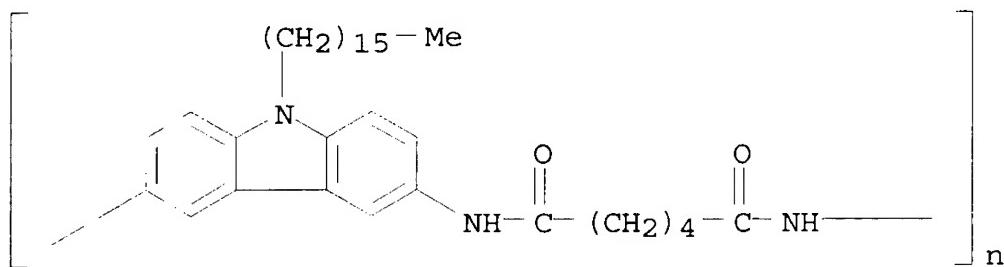
RN 58130-99-7 ZCA

CN Poly[(9-nonyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyiyl)imino] (9CI) (CA INDEX NAME)

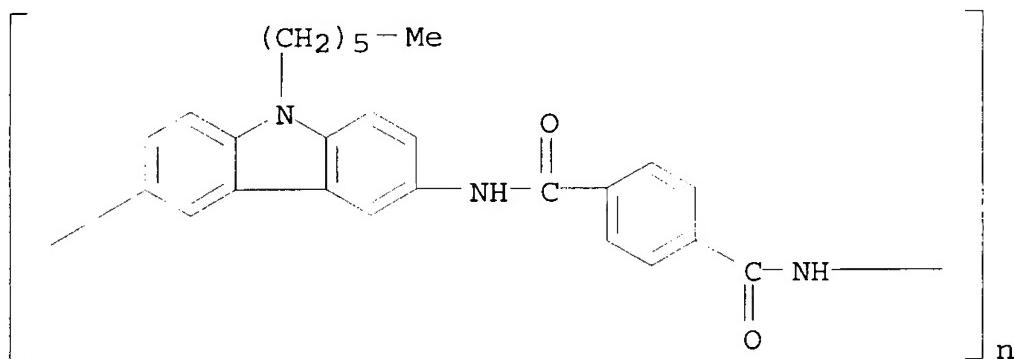


RN 58131-00-3 ZCA

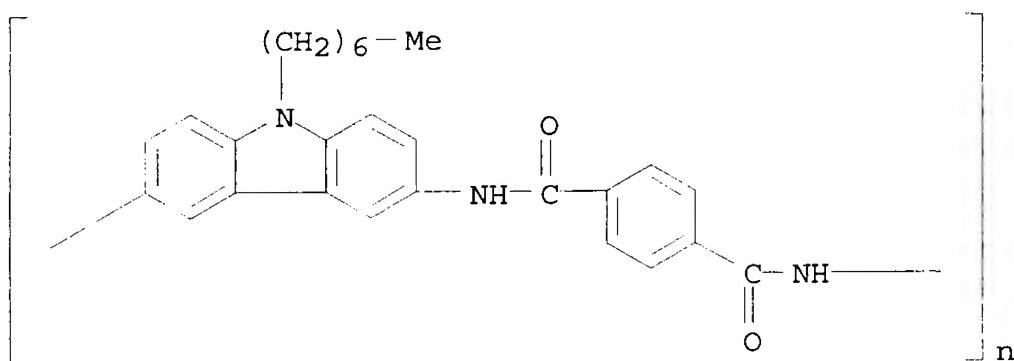
CN Poly[(9-hexadecyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyiyl)imino] (9CI) (CA INDEX NAME)



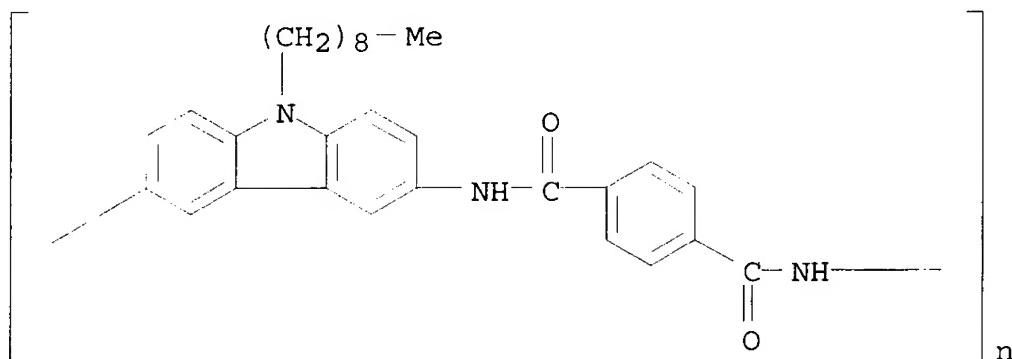
RN 58131-04-7 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)



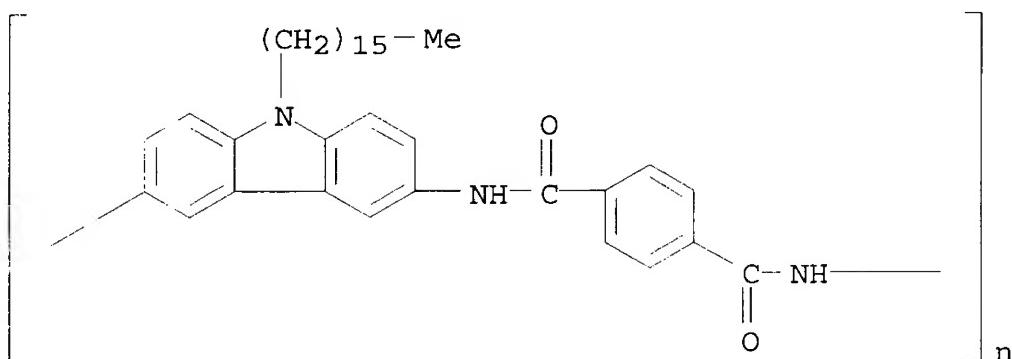
RN 58131-05-8 ZCA  
 CN Poly[(9-heptyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)



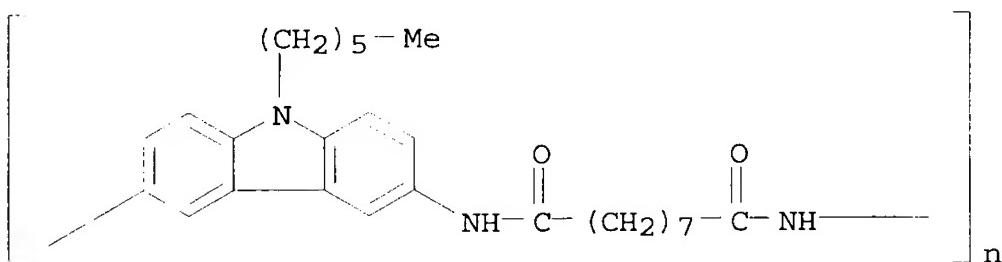
RN 58131-06-9 ZCA  
 CN Poly[(9-nonyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)



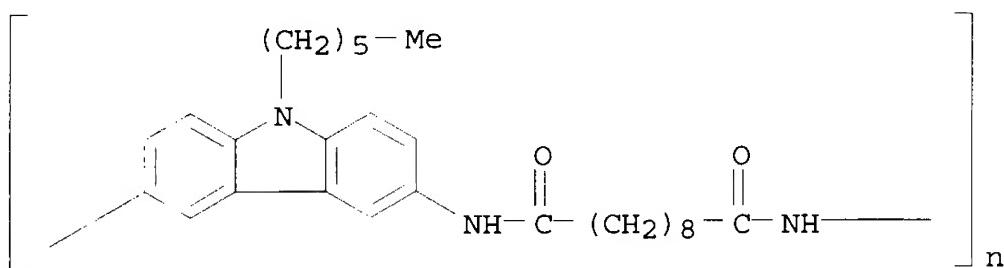
RN 58131-07-0 ZCA  
 CN Poly[(9-hexadecyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenylene carbonylimino] (9CI) (CA INDEX NAME)



RN 58131-11-6 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,9-dioxo-1,9-nonanediyi)imino] (9CI) (CA INDEX NAME)



RN 58131-12-7 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,10-dioxo-1,10-decanediyl)imino] (9CI) (CA INDEX NAME)



IT 58130-97-5 58130-98-6 58130-99-7  
 58131-00-3 58131-04-7 58131-05-8  
 58131-06-9 58131-07-0 58131-11-6  
 58131-12-7

(thermal properties of, detn. of, by DTA)

L44 ANSWER 26 OF 27 ZCA COPYRIGHT 2003 ACS

85:193161 Polyamides containing the carbazole ring. I. Synthesis of oligomers. Pielichowski, Jan; Domanski, Andrzej (Inst. Chem. Technol. Org., Politech. Krakow, Krakow, Pol.). Chemia Stosowana, 20(2), 251-9 (Polish) 1976. CODEN: CHSWAP. ISSN: 0376-0898.

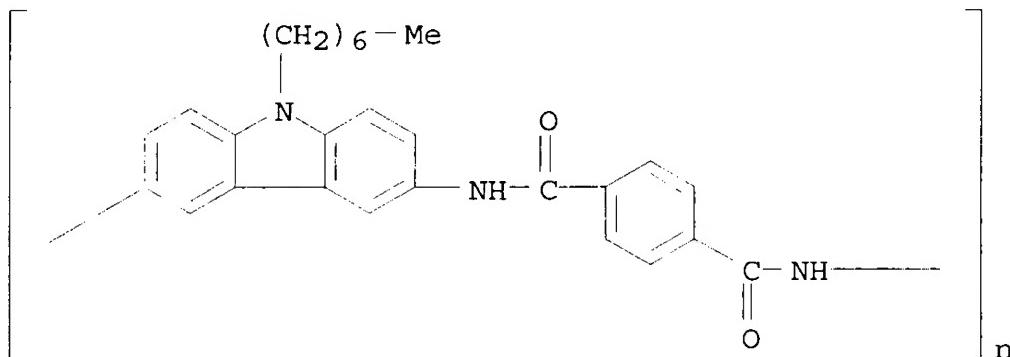
AB 3,6-Dinitro-9-alkylcarbazoles (I) (alkyl = Et, Bu, n-pentyl, n-hexyl, n-heptyl, n-nonyl, n-hexadecyl) are prep'd. from 9-alkylcarbazole and reduced to give 3,6-diamino-9-alkylcarbazoles (II), which are oligomerized with oxalic, adipic, suberic, azelaic, sebacic, and terephthalic acid (III). Thus, I were prep'd. by nitration of 9-alkylcarbazoles in glacial AcOH and concd. HNO<sub>3</sub> at l.toreq. 55.degree.; II were prep'd. by redn. of I with hydrazine in EtOH in presence of Pd on charcoal at 50% and then at the b.p. of EtOH. Oligomerization of II with all dicarboxylic acids except III was effected in a melt at a temp. greater than the m.p. of the 2 components (mol. wts. of oligomers ranged from 1401 to 10,540). Thermal stability of the polyamides, expressed as wt. loss of 1%, ranged from 280 to 400.degree..

IT 58131-05-8P 58131-06-9P 58131-07-0P  
 58131-11-6P 58131-12-7P

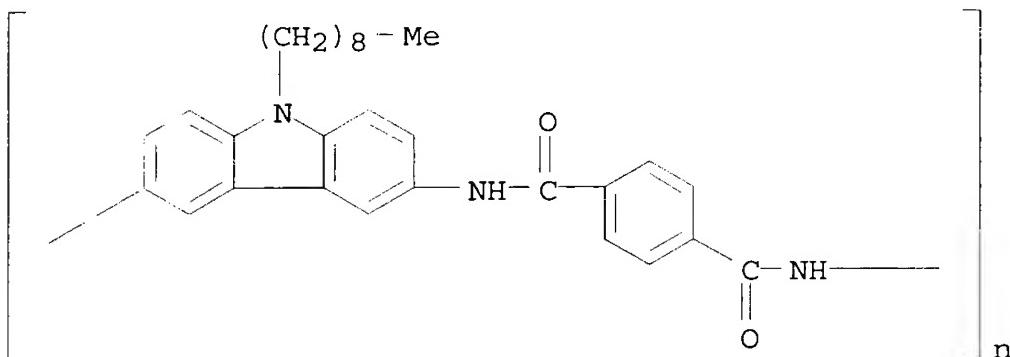
(oligomeric, prepn. and properties of)

RN 58131-05-8 ZCA

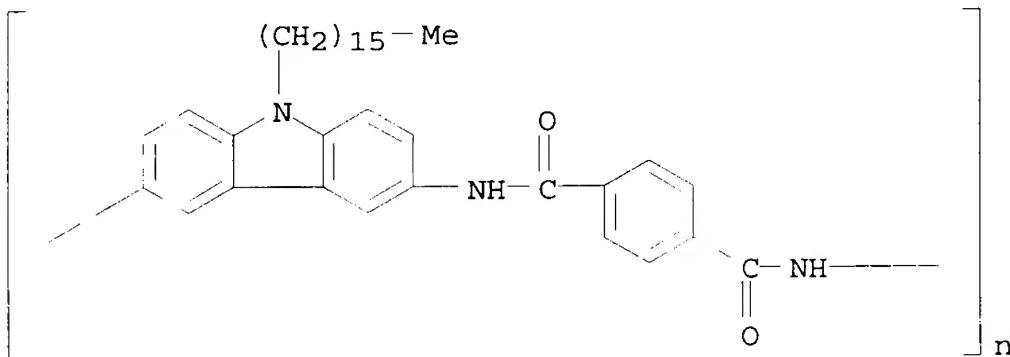
CN Poly[(9-heptyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenylene carbonylimino] (9CI) (CA INDEX NAME)



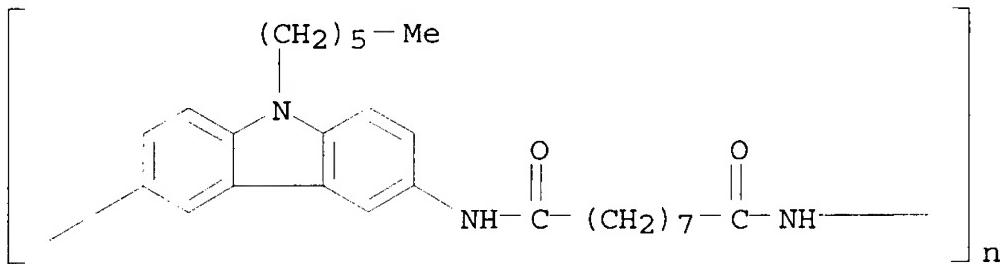
RN 58131-06-9 ZCA  
 CN Poly[(9-nonyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)



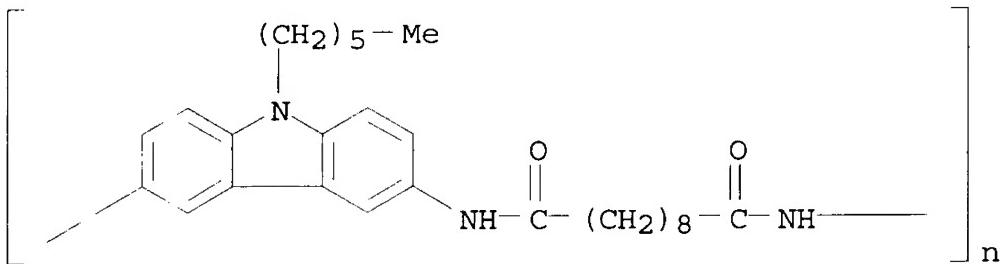
RN 58131-07-0 ZCA  
 CN Poly[(9-hexadecyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)



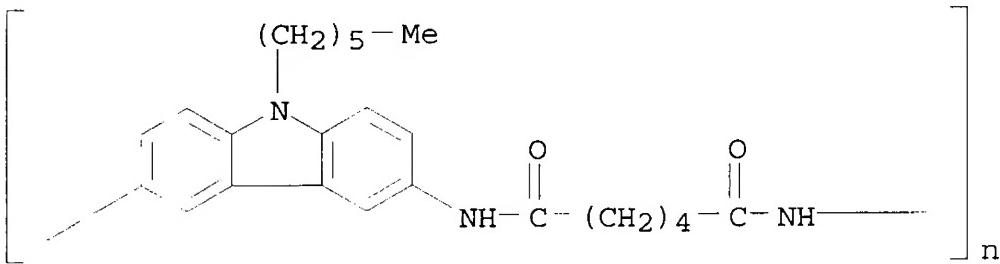
RN 58131-11-6 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,9-dioxo-1,9-nonanediyi)imino] (9CI) (CA INDEX NAME)



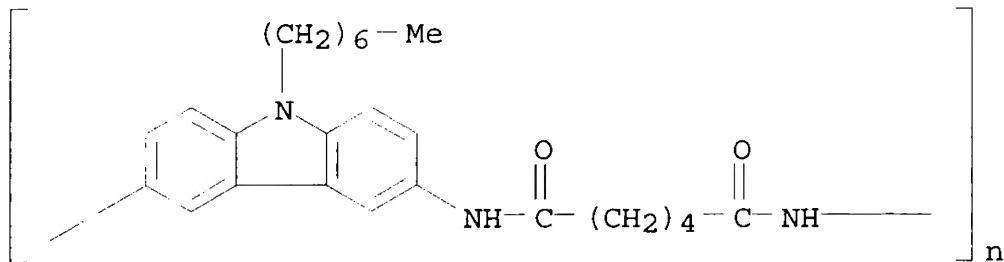
RN 58131-12-7 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,10-dioxo-1,10-decanediyl)imino] (9CI) (CA INDEX NAME)



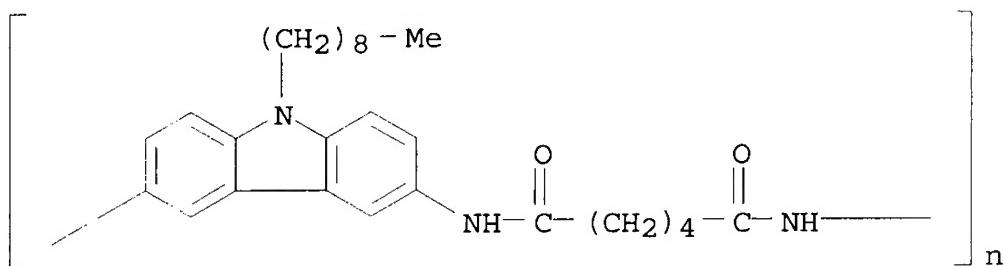
IT 58130-97-5P 58130-98-6P 58130-99-7P  
 58131-00-3P  
 (oligomeric, prepn. and thermal stability of)  
 RN 58130-97-5 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyl)imino] (9CI) (CA INDEX NAME)



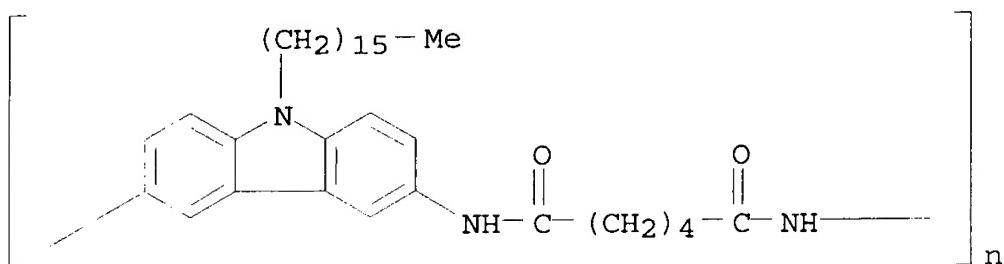
RN 58130-98-6 ZCA  
 CN Poly[(9-heptyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyl)imino] (9CI) (CA INDEX NAME)



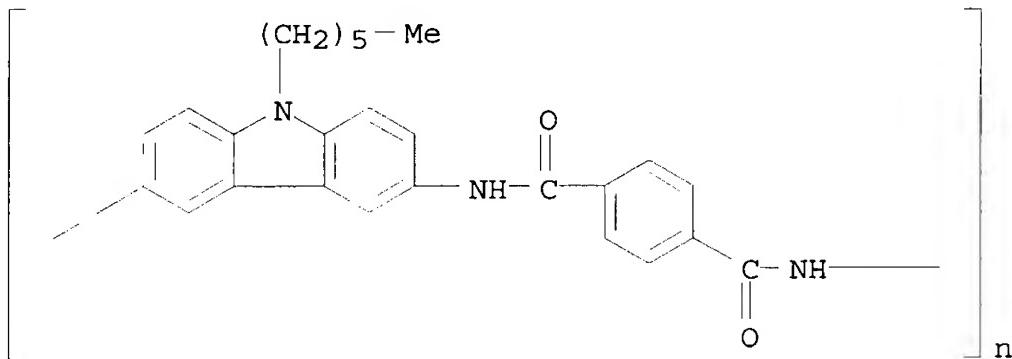
RN 58130-99-7 ZCA  
 CN Poly[(9-nonyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyliimino)] (9CI) (CA INDEX NAME)



RN 58131-00-3 ZCA  
 CN Poly[(9-hexadecyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyliimino)] (9CI) (CA INDEX NAME)



IT 58131-04-7P  
 (prepn. of)  
 RN 58131-04-7 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenylene carbonylimino] (9CI) (CA INDEX NAME)



- IT 58131-05-8P 58131-06-9P 58131-07-0P  
 58131-11-6P 58131-12-7P  
 (oligomeric, prepn. and properties of)  
 IT 58130-97-5P 58130-98-6P 58130-99-7P  
 58131-00-3P  
 (oligomeric, prepn. and thermal stability of)  
 IT 58131-04-7P  
 (prepn. of)

L44 ANSWER 27 OF 27 ZCA COPYRIGHT 2003 ACS

84:74944 Thermal studies of polyamides from 3,6-diamino-9-n-alkylcarbazoles and dicarboxylic acids. Pielichowski, Jan; Domanski, Andrzej (Inst. Chem. Technol. Org., Politech. Krakow, Krakow, Pol.). Polimery (Warsaw, Poland), 20(9), 432-4 (Polish) 1975. CODEN: POLIA4. ISSN: 0032-2725.

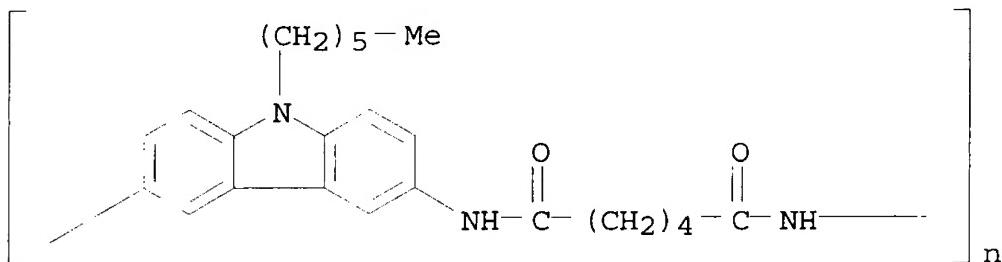
AB The DTA, thermal gravimetry, (GG) and differential thermal gravimetry (DTG) were carried out of 25 polyamides prep'd. from the title compds. The DTA curves had inflections indicating glass point, m.p., and beginning of exothermic decomprn.; the TG curves served to det. the temp. ( $t_4$ ) at which 1% wt. loss was obsd., and the DTG curves showed the start of rapid decomprn. ( $t_5$ ). The most stable polyamides were obtained from 3,6-diamino-9-n-alkylcarbazoles with 2-6 carbons in the alkyl chain. The length of aliph. dicarboxylic acid chains did not affect the stability of polyamides, but those contg. terephthalic acid units had relatively low stability. Outstanding stability ( $t_4 = 380-97.\text{degree}.$ ,  $t_5 = 420-450.\text{degree}$ . was obsd. for 3,6-diamino-9-ethylcarbazole-adipic acid copolymer [58145-91-8], 3,6-diamino-9-ethylcarbazole-suberic acid copolymer [58145-92-9], 3,6-diamino-9-ethylcarbazole-azelaic acid copolymer [58145-93-0], and 3,6-diamino-9-hexylcarbazole-azelaic acid copolymer [58145-94-1].

- IT 58130-97-5 58130-98-6 58130-99-7  
 58131-00-3 58131-04-7 58131-05-8  
 58131-06-9 58131-07-0 58131-11-6  
 58131-12-7

(thermal properties of, detn. of)

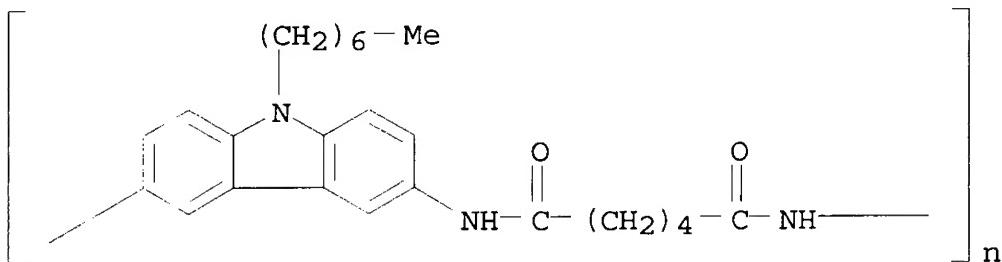
RN 58130-97-5 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-

hexanediyyl)imino] (9CI) (CA INDEX NAME)



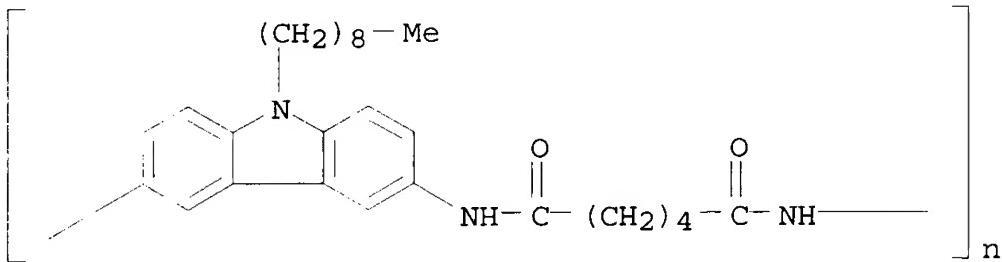
RN 58130-98-6 ZCA

CN Poly[(9-heptyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyyl)imino] (9CI) (CA INDEX NAME)



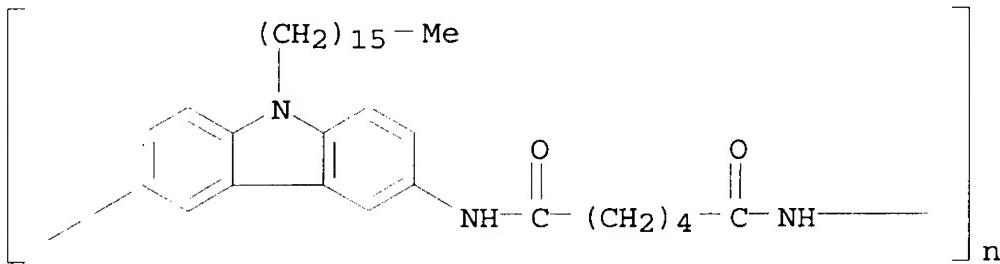
RN 58130-99-7 ZCA

CN Poly[(9-nonyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyyl)imino] (9CI) (CA INDEX NAME)

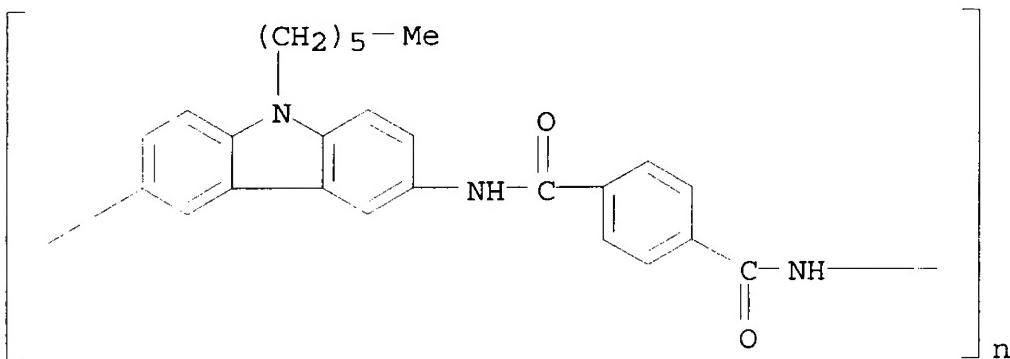


RN 58131-00-3 ZCA

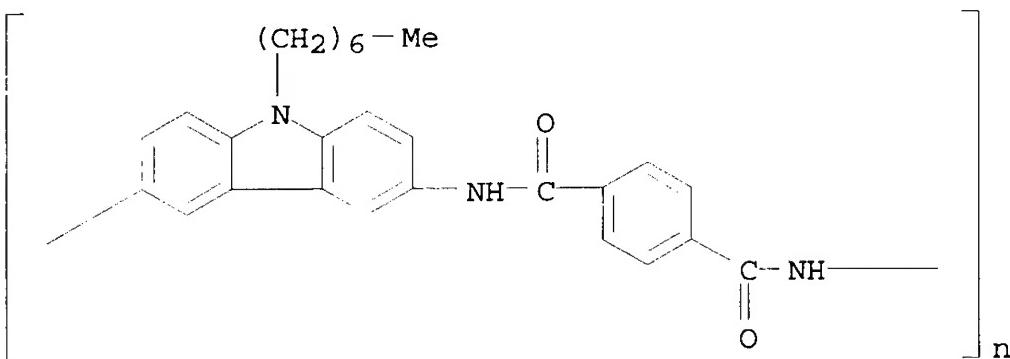
CN Poly[(9-hexadecyl-9H-carbazole-3,6-diyl)imino(1,6-dioxo-1,6-hexanediyyl)imino] (9CI) (CA INDEX NAME)



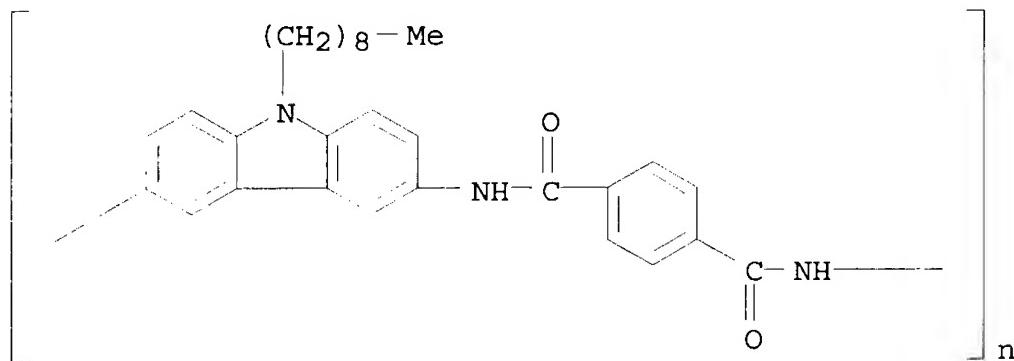
RN 58131-04-7 ZCA  
 CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)



RN 58131-05-8 ZCA  
 CN Poly[(9-heptyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)

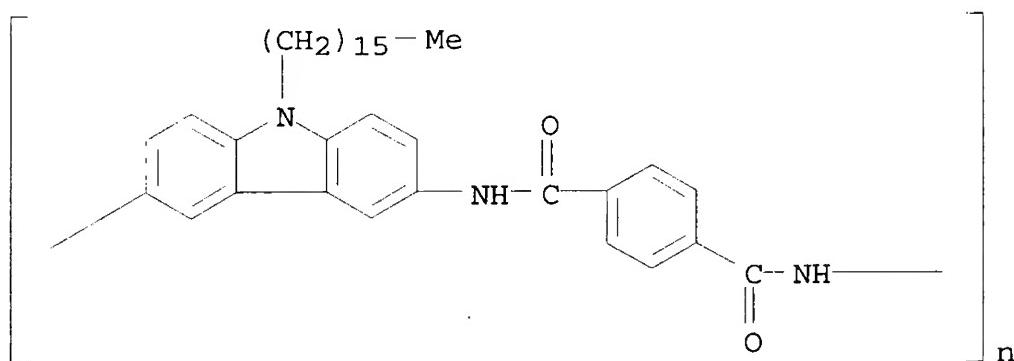


RN 58131-06-9 ZCA  
 CN Poly[(9-nonyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenlenecarbonylimino] (9CI) (CA INDEX NAME)



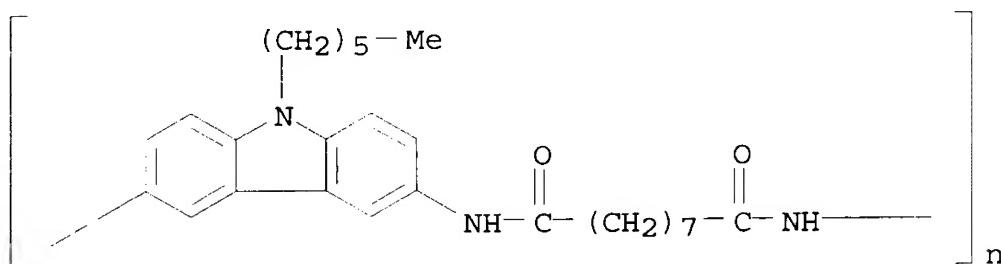
RN 58131-07-0 ZCA

CN Poly[(9-hexadecyl-9H-carbazole-3,6-diyl)iminocarbonyl-1,4-phenylene carbonylimino] (9CI) (CA INDEX NAME)



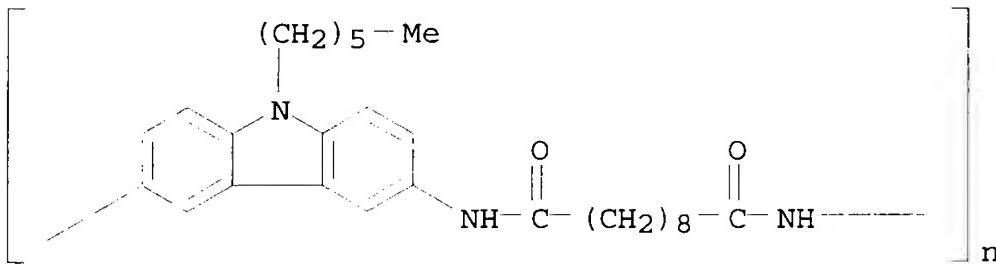
RN 58131-11-6 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,9-dioxo-1,9-nonanediyi)imino] (9CI) (CA INDEX NAME)



RN 58131-12-7 ZCA

CN Poly[(9-hexyl-9H-carbazole-3,6-diyl)imino(1,10-dioxo-1,10-decanediyl)imino] (9CI) (CA INDEX NAME)



IT 58130-97-5 58130-98-6 58130-99-7  
 58131-00-3 58131-04-7 58131-05-8  
 58131-06-9 58131-07-0 58131-11-6  
 58131-12-7

(thermal properties of, detn. of)

=> d his 145-

FILE 'LREGISTRY' ENTERED AT 17:12:46 ON 13 MAR 2003  
 E THIOPHENE/CN

L45 1 S E3  
 L46 889 S 16.145.3/RID  
 E FLUORENE/CN  
 L47 1 S E3  
 L48 257 S 1839.6.36/RID

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 L49 43 S L19 AND (L46 OR L48)

FILE 'ZCA' ENTERED AT 17:14:11 ON 13 MAR 2003  
 L50 30 S L49  
 L51 20 S L50 NOT (L43 OR L44)

FILE 'REGISTRY' ENTERED AT 17:15:29 ON 13 MAR 2003  
 L52 15 S L19 AND L46

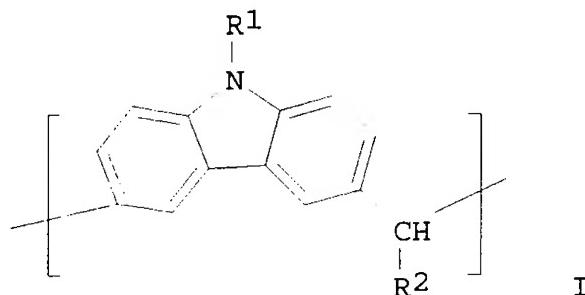
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 L53 13 S L52  
 L54 7 S L53 NOT (L43 OR L44)  
 L55 13 S L50 NOT (L43 OR L44 OR L54)

=> d 154 1-7 cbib abs hitstr hitrn

L54 ANSWER 1 OF 7 ZCA COPYRIGHT 2003 ACS

137:186034 Substituted carbazole structure-containing polymers and their use in light emitting devices. Araki, Katsumi (Fuji Photo Film Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002241455 A2 20020828, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-41829 20010219.

GI



**AB** The polymers with high carrier injection and carrier transport properties and stability to heat, have repeating units of I ( $R_1 =$  aryl, heterocyclic, aralkyl, alkyl, polymerizable groups;  $R_2 =$  aryl, heterocyclic groups) and exhibit a min. excitation triplet energy level of 40 kcal/mol (167 kJ/mol) to 90 kcal/mol (376 kJ/mol). Thus, heating a mixt. of N-phenylcarbazole (II) 2.00, benzaldehyde 1.05, p-toluenesulfonic acid hydrate 1.05 and chlorobenzene (3 mL) at 120.degree. for 16 h while removing water, adding II (as end capping agent) 0.2 g and heating for another 6 h gave a copolymer having  $M_w$  3600, ionization potential 5.83 eV, electron affinity 2.5 eV, energy gap 3.33 eV, light-emitting max. wavelength in soln. 366 nm, and absorption max. wavelengths 247, 267 and 304 nm (in  $\text{CHCl}_3$ ,  $1 \times 10^7 \text{ mol/L}$ ).

**IT** **449194-47-2P**, N-Ethylcarbazole-3-thiophenecarboxaldehyde copolymer

(substituted carbazole structure-contg. polymers and use in light emitting devices)

**RN** 449194-47-2 ZCA

**CN** 3-Thiophenecarboxaldehyde, polymer with 9-ethyl-9H-carbazole (9CI) (CA INDEX NAME)

**CM** 1

**CRN** 498-62-4

**CMF** C5 H4 O S

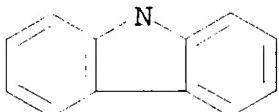


CHO

**CM** 2

CRN 86-28-2  
 CMF C14 H13 N

Et



IT **449194-47-2P**, N-Ethylcarbazole-3-thiophenecarboxaldehyde copolymer  
 (substituted carbazole structure-contg. polymers and use in light emitting devices)

L54 ANSWER 2 OF 7 ZCA COPYRIGHT 2003 ACS

136:232642 Synthesis and characterization of polythiophene derivatives containing electron transporting and hole transporting moieties.  
 Kim, Sungman; Ahn, Taekyuong; Han, Sien-Ho; Kim, Eung-Ryul; Lee, Haiwon (Department of Chemistry, Hanyang University, Seoul, 133-791, S. Korea). Molecular Crystals and Liquid Crystals Science and Technology, Section A: Molecular Crystals and Liquid Crystals, 371, 301-304 (English) 2001. CODEN: MCLCE9. ISSN: 1058-725X.

Publisher: Gordon & Breach Science Publishers.

AB Novel luminescent copolymers, poly(3-(2-benzotriazoloethyl)thiophene-co-octylcarbazolylene) ( $[(BET)m-OcCz2]n$ ) that contain both electron transporting benzotriazole and hole transporting octyl carbazole moiety were synthesized by oxidn. of ferric chloride with changing the compn. ratio of BET and OcCz. The absorption peak of UV-VIS was blue-shifted from  $\lambda_{max} = 440$  nm in poly(3-(2-benzotriazoloethyl)thiophene) (PBET) to  $\lambda_{max} = 412$  nm in  $[(BET)_4-OcCz2]n$ . The photoluminescence (PL) and electroluminescence (EL) intensities of the polymers were decreased with presence of carbazole moieties in the copolymer.

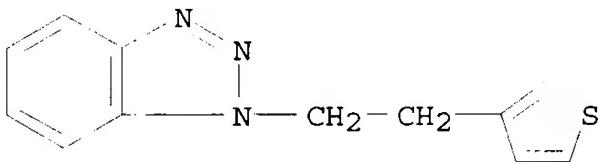
IT **403518-28-5P**  
 (polythiophene derivs. contg. electron transporting and hole transporting moieties)

RN 403518-28-5 ZCA

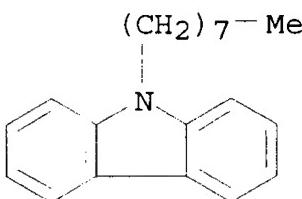
CN 9H-Carbazole, 9-octyl-, polymer with 1-[2-(3-thienyl)ethyl]-1H-benzotriazole (9CI) (CA INDEX NAME)

CM 1

CRN 329310-86-3  
 CMF C12 H11 N3 S



CM 2

CRN 4041-19-4  
CMF C20 H25 N

IT 403518-28-5P

(polythiophene derivs. contg. electron transporting and hole transporting moieties)

L54 ANSWER 3 OF 7 ZCA COPYRIGHT 2003 ACS

135:325070 Patterning of polymer light emitting devices using electrochemical polymerization. Zhuang, Zhming; Warren, Leslie F., Jr.; Williams, George M.; Cheung, Jeffrey T. (Rockwell Technologies, LLC, USA). PCT Int. Appl. WO 2001078151 A2 20011018, 40 pp.  
DESIGNATED STATES: W: JP; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (English). CODEN: PIXXD2.  
APPLICATION: WO 2001-US7176 20010307. PRIORITY: US 2000-546783 20000411.

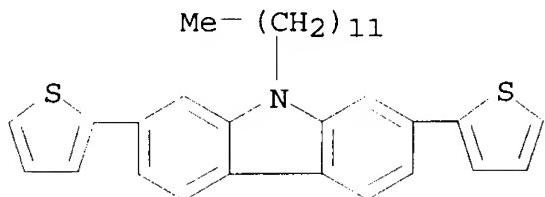
AB Methods of forming light-emitting layers on .gtoreq.1 selected electrode of an org. light-emitting diode are described which entail exposing the selected electrode(s) to a precursor monomer of an electroluminescent polymer (e.g., by placing it in an electrochem. bath contg. the monomer) and electrochem. converting the precursor monomer to the electroluminescent polymer. Org. electroluminescent devices fabricated using the methods are also described.

IT 367922-11-0P  
(org. light-emitting devices and their fabrication using electrochem. polymn.)RN 367922-11-0 ZCA  
CN 9H-Carbazole, 9-dodecyl-2,7-di-2-thienyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 367922-10-9

CMF C32 H37 N S2



IT 367922-11-0P

(org. light-emitting devices and their fabrication using electrochem. polymn.)

L54 ANSWER 4 OF 7 ZCA COPYRIGHT 2003 ACS

134:367310 Synthesis of polymers with isolated thiophene-arylidene-thiophene chromophores for enhanced and specific electron/hole transport. Silcoff, Elliad R.; Asadi, Ahmed S. I.; Sheradsky, Tuvia (Department of Organic Chemistry, Hebrew University, Jerusalem, 91904, Israel). Journal of Polymer Science, Part A: Polymer Chemistry, 39(6), 872-879 (English) 2001. CODEN: JPACEC. ISSN: 0887-624X. Publisher: John Wiley & Sons, Inc..

AB The synthesis of 9 new polymers intended for future use in light-emitting diodes is described. The polymers consist of alternating units of thiophene-arylidene-thiophene chromophores and satd. Si-contg. spacers. The arylidene moieties include benzene-1,4-, 2,5-dimethoxybenzene-1,4-, naphthalene-1,4-, anthracene-9,10-, pyridine-2,5-, pyridine-2,6-, N-methylcarbazole-3,6-, 1,3,4-oxadiazole-2,5-, and 4,4'-dimethyl-2,2'-bithiazole-5,5'-. The syntheses involved dibromination of the central arene followed by Suzuki or Kumada cross-coupling reactions with 2 thiophene units. Subsequent dilithiation and reaction with dihalosilylalkanes provided the polymers. Their optical properties, including UV-visible absorption and emission in soln., were comparable to those of the parent monomer units, and they possessed the phys. characteristics of macromols.

IT 340015-72-7P 340015-82-9P

(synthesis of polymers with isolated thiophene-arylidene-thiophene chromophores for enhanced and specific electron/hole transport)

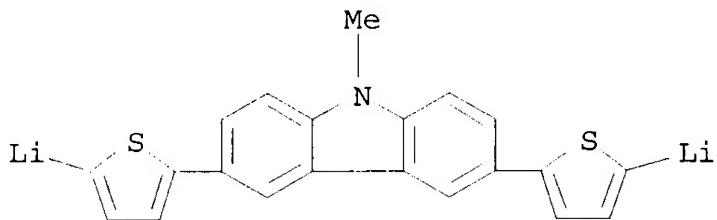
RN 340015-72-7 ZCA

CN Lithium, [.mu.-[(9-methyl-9H-carbazole-3,6-diyl)di-5,2-thiophenediyl]]di-, polymer with 1,2-ethanediylbis[chlorodimethylsilane] (9CI) (CA INDEX NAME)

CM 1

CRN 340015-71-6

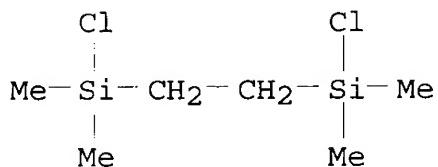
CMF C21 H13 Li2 N S2



CM 2

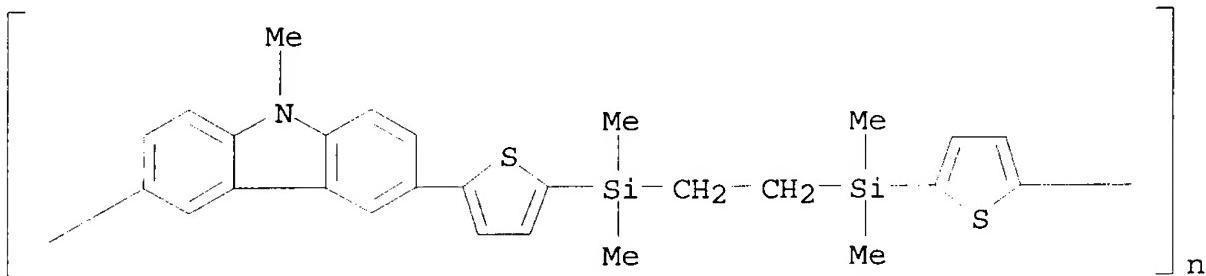
CRN 13528-93-3

CMF C6 H16 Cl2 Si2



RN 340015-82-9 ZCA

CN Poly[(9-methyl-9H-carbazole-3,6-diyl)-2,5-thiophenediyl(dimethylsilylene)-1,2-ethanediyl(dimethylsilylene)-2,5-thiophenediyl] (9CI) (CA INDEX NAME)



IT 340015-72-7P 340015-82-9P

(synthesis of polymers with isolated thiophene-arylidene-thiophene chromophores for enhanced and specific electron/hole transport)

L54 ANSWER 5 OF 7 ZCA COPYRIGHT 2003 ACS

130:330229 Charge transport and electrode injection in polymer light-emitting diodes. Bussac, Marie-Noelle; Michoud, Didier; Titis, Eduard; Zuppiroli, Libero (Centre de Physique Theorique, CNRS, Ecole Polytechnique, Palaiseau, F-91128, Fr.). Proceedings of SPIE-The International Society for Optical Engineering, 3476 (Organic Light-Emitting Materials and Devices II), 156-166 (English) 1998.  
 CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International

Society for Optical Engineering.

AB We present a microscopic theory of charge transport in conjugated polymers based on polaron drift along polymer segment and on polaron hopping between segments. We show that this model is able to reproduce the current-voltage characteristics of "good" hole-only devices based on PPV (space charge limited currents), in the whole range of fields. We present a microscopic theory of electrode injection into conjugated polymers. We show that this model is able to reproduce the current voltage characteristics of contact limited devices based on PPV.

IT 184293-34-3

(charge transport and electrode injection in LED contg.)

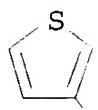
RN 184293-34-3 ZCA

CN 9H-Carbazole, 9-octyl-, polymer with 3-octylthiophene (9CI) (CA INDEX NAME)

CM 1

CRN 65016-62-8

CMF C12 H20 S



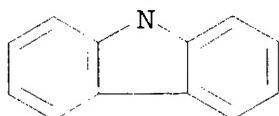
$(\text{CH}_2)_7-\text{Me}$

CM 2

CRN 4041-19-4

CMF C20 H25 N

$(\text{CH}_2)_7-\text{Me}$



IT 184293-34-3

(charge transport and electrode injection in LED contg.)

L54 ANSWER 6 OF 7 ZCA COPYRIGHT 2003 ACS

126:24567 The role of carbazole in organic light-emitting devices.

Romero, D. B.; Schaer, M.; Leclerc, M.; Ades, D.; Siove, A.; Zuppiroli, L. (Physics Department, Swiss Federal Institute of Technology, Lausanne, CH-1015, Switz.). Synthetic Metals, 80(3), 271-277 (English) 1996. CODEN: SYMEDZ. ISSN: 0379-6779.

Publisher: Elsevier.

AB New org. oligomers and polymers based on the carbazole mol. are explored for possible applications in light-emitting devices. In 1 case, (butyl- or octyl-) carbazole dimers and poly(N-butyl-3,6-carbazolylene) polymer were used as the hole-transporting and light-emitting layer in multilayer light-emitting diodes (LEDs). These devices yielded bright blue light (as much as .apprx.6000 candela m-2) with high external quantum (.apprx.10%) and luminance efficiencies (.apprx.2 lm W-1). The other case involved ([3-octylthiophene] [bis-(N-Et or octyl carbazolylene)]) multiblock copolymers as the active emitting layer in single-layer LEDs. Color tuning was achieved in these devices by changing the no. of monomer units contained in the thiophene chain. The authors also obsd. an increase of the external quantum efficiency in diodes based on the copolymers with short thiophene segments that the authors attributed to a more balanced charge injection.

IT 164524-53-2P 184293-34-3P  
 (role of carbazole deriv. polymers (with Bu and octyl substituents) in org. light-emitting devices and their luminescence, electroluminescence, and UV/visible spectra)

RN 164524-53-2 ZCA

CN 9H-Carbazole, 9-ethyl-, polymer with 3-octylthiophene (9CI) (CA INDEX NAME)

CM 1

CRN 65016-62-8

CMF C12 H20 S



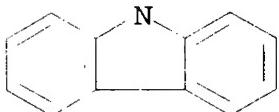
$(\text{CH}_2)_7-\text{Me}$

CM 2

CRN 86-28-2

CMF C14 H13 N

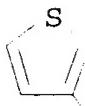
Et



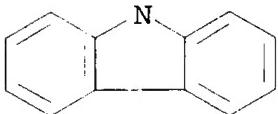
RN 184293-34-3 ZCA

CN 9H-Carbazole, 9-octyl-, polymer with 3-octylthiophene (9CI) (CA INDEX NAME)

CM 1

CRN 65016-62-8  
CMF C12 H20 S(CH<sub>2</sub>)<sub>7</sub>-Me

CM 2

CRN 4041-19-4  
CMF C20 H25 N(CH<sub>2</sub>)<sub>7</sub>-Me

IT 164524-53-2P 184293-34-3P

(role of carbazole deriv. polymers (with Bu and octyl substituents) in org. light-emitting devices and their luminescence, electroluminescence, and UV/visible spectra)

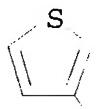
L54 ANSWER 7 OF 7 ZCA COPYRIGHT 2003 ACS

123:33796 Oxidative homo- and copolymerizations of substituted carbazole and thiophene. Siove, A.; David, R.; Ades, D.; Roux, C.; Leclerc, M. (Lab. rech. macromol., Univ. Paris-Nord, Villetteaneuse, 93430, Fr.). Journal de Chimie Physique et de Physico-Chimie Biologique, 92(4), 787-90 (English) 1995. CODEN: JCPBAN. ISSN: 0021-7689.  
Publisher: Elsevier.AB Chem. oxidn. of N-ethylcarbazole by FeCl<sub>3</sub> quant. yields dimer. Oxidn. is the rate-detg. step among the three elementary reactions involved in the process. Oxidn. of 3-octylthiophene in the same conditions leads to the formation very rapidly of high mol. wts. through the coupling of oligomeric active species. Copolymn. of the monomers by FeCl<sub>3</sub> gives rise to materials whose solv. and thermochromism depend on the compn., and therefore can be tuned.IT 164524-53-2P, N-Ethylcarbazole-3-octylthiophene copolymer  
(prepn. and thermochromic properties of)

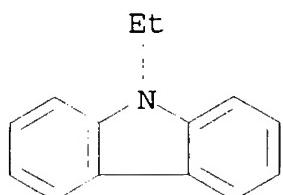
RN 164524-53-2 ZCA

CN 9H-Carbazole, 9-ethyl-, polymer with 3-octylthiophene (9CI) (CA INDEX NAME)

CM 1

CRN 65016-62-8  
CMF C12 H20 S(CH<sub>2</sub>)<sub>7</sub>-Me

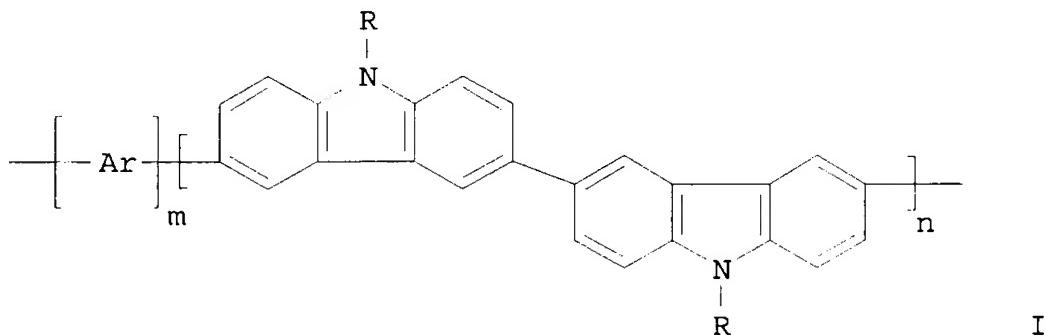
CM 2

CRN 86-28-2  
CMF C14 H13 NIT 164524-53-2P, N-Ethylcarbazole-3-octylthiophene copolymer  
(prepn. and thermochromic properties of)

=&gt; d 155 1-13 cbib abs fhitstr hitrn

L55 ANSWER 1 OF 13 ZCA COPYRIGHT 2003 ACS  
 138:39739 White electroluminescent polymer containing 3,3'-bicarbazole group incorporated into polyarylene main chain. Lee, Ji Hoon; Kang, In Nam (Samsung Sdi Co. Ltd, S. Korea). Brit. UK Pat. Appl. GB 2376469 A1 20021218, 57 pp. (English). CODEN: BAXXDU.  
 APPLICATION: GB 2002-2559 20020204. PRIORITY: KR 2001-33140 20010613.

GI



**AB** A white electroluminescent polymer (I) comprises 3,3'-bicarbazole group incorporated into a polyarylene main chain, where Ar represents C<sub>6</sub>-C<sub>26</sub>-aryls or C<sub>4</sub>-C<sub>14</sub>-aryls contg. at least one heteroatom, aryls being unsubstituted or substituted with at least one C<sub>1</sub>-C<sub>12</sub>-alkyl, alkoxy or amine-functional radical, R represents hydrogen, linear, branched or cyclic C<sub>1</sub>-C<sub>12</sub>-alkyl groups, C<sub>6</sub>-C<sub>14</sub>-aryls unsubstituted or substituted with C<sub>1</sub>-C<sub>12</sub>-alkyl, alkoxy or amine-functional radicals, m and n are independent nos. conforming to 0.1 .ltoreq. m/(m+n) .ltoreq. 0.9 and 0.1 .ltoreq. n/(m+n) .ltoreq. 0.9. The polymers are used in manuf. of electroluminescent devices. Thus, white electroluminescent polymer was produced by copolyrn. of N,N'-diethyl-6,6'-dibromo-3,3'-bicarbazole and 9,9-di(2-ethylhexyl)-2,7-dibromofluorene at 80.degree. for 72 h in DMF/toluene in the presence of bis(1,4-cyclooctadiene)nickel catalyst.

**IT** **478548-51-5P**

(prodn. of white electroluminescent polymers contg. bicarbazole group incorporated into polyarylene main chain)

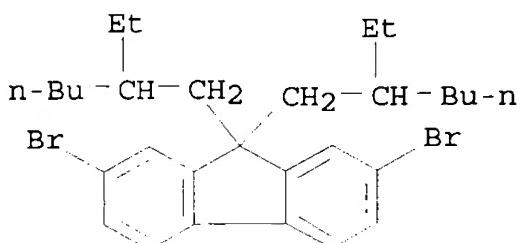
**RN** 478548-51-5 ZCA

**CN** 3,3'-Bi-9H-carbazole, 6,6'-dibromo-9,9'-diethyl-, polymer with 2,7-dibromo-9,9-bis(2-ethylhexyl)-9H-fluorene (9CI) (CA INDEX NAME)

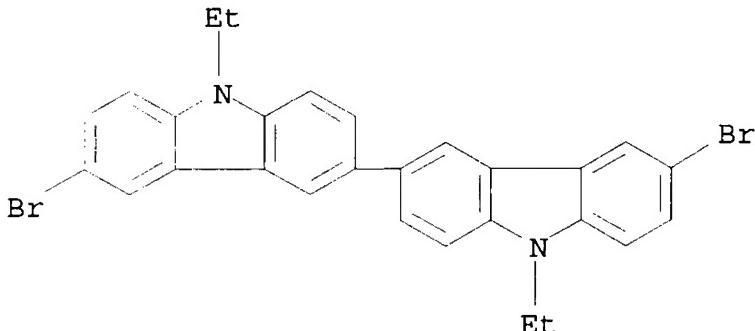
**CM** 1

**CRN** 188200-93-3

**CMF** C29 H40 Br2



CM 2

CRN 57102-86-0  
CMF C28 H22 Br2 N2

IT 478548-51-5P

(prodn. of white electroluminescent polymers contg. bicarbazole group incorporated into polyarylene main chain)

L55 ANSWER 2 OF 13 ZCA COPYRIGHT 2003 ACS

137:377516 Electroluminescent devices fabricated with encapsulated light emitting polymer particles. Murasko, Matthew; Kinlen, Patrick J.; St. John, Brent (Lumimove, Inc., USA). PCT Int. Appl. WO 2002087308 A2 20021107, 21 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-US13547 20020430. PRIORITY: US 2001-PV287612 20010430; US 2001-PV287321 20010430.

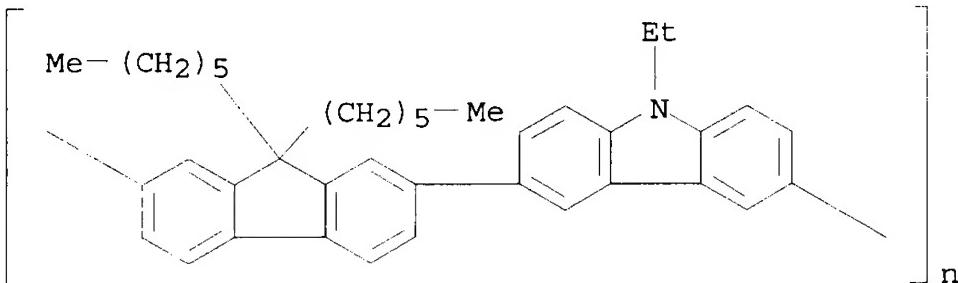
AB Methods for fabricating electroluminescent display devices are described which entail encapsulating org. light-emitting material particles with a conductive polymer; formulating an ink by mixing the encapsulated particles with binder polymers; depositing a conducting rear electrode onto a substrate in a pattern; depositing the ink onto rear electrode patterns to form a light-emitting layer; depositing a transparent hole transporting electrode onto the light-emitting layer; depositing a front outlining electrode onto the hole transporting electrode; and depositing connection leads to the rear electrode and the front outlining electrode.

IT 474975-23-0

(electroluminescent display fabrication using polymer-encapsulated light-emitting particles)

RN 474975-23-0 ZCA

CN Poly[(9-ethyl-9H-carbazole-3,6-diyl)(9,9-dihexyl-9H-fluorene-2,7-diyl)] (9CI) (CA INDEX NAME)



IT 474975-23-0  
(electroluminescent display fabrication using polymer-encapsulated light-emitting particles)

L55 ANSWER 3 OF 13 ZCA COPYRIGHT 2003 ACS

135:195887 Decreased Aggregation Phenomena in Polyfluorenes by Introducing Carbazole Copolymer Units. Xia, Chuanjun; Advincula, Rigoberto C. (Department of Chemistry, The University of Alabama at Birmingham, Birmingham, AL, 35294, USA). Macromolecules, 34(17), 5854-5859 (English) 2001. CODEN: MAMOBX. ISSN: 0024-9297.

Publisher: American Chemical Society.

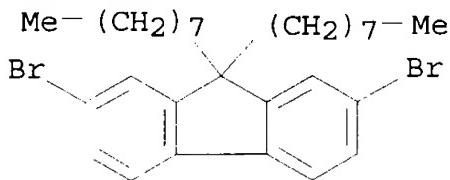
AB To decrease aggregation phenomena and improve the luminescence of the blue-light-emitting polymer polyfluorene, carbazole units were copolymerd. to introduce disorder in the polymer backbone. A "kink" linkage was introduced into the polyfluorene chain by forming a 9:1 and 7:3 copolymer with the carbazole group at the 3,6 positions. The disordered polyfluorene was made though a Ni-catalyzed reaction, which resulted in high yield and high mol. wt. polymers. The structure and phys. properties were confirmed by NMR, SEC, UV absorption, photoluminescence, elemental anal., and quantum yield measurements. The copolymers exhibited better spectral properties both in soln. and in film compared to previously synthesized polyfluorene homopolymers. Annealing studies showed both improved thermal and UV stability of the copolymer over previously reported homopolymers. Cyclic voltammetry studies showed a slightly lower HOMO than the homopolymer.

IT 356786-56-6P  
(introduction of carbazole units in polyfluorenes for improved luminescence and decreased aggregation)

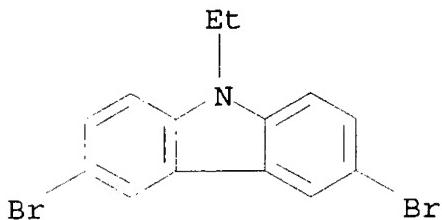
RN 356786-56-6 ZCA  
CN 9H-Carbazole, 3,6-dibromo-9-ethyl-, polymer with 2,7-dibromo-9,9-dioctyl-9H-fluorene (9CI) (CA INDEX NAME)

CM 1

CRN 198964-46-4  
CMF C29 H40 Br2



CM 2

CRN 33255-13-9  
CMF C14 H11 Br2 N

IT 356786-56-6P

(introduction of carbazole units in polyfluorenes for improved luminescence and decreased aggregation)

L55 ANSWER 4 OF 13 ZCA COPYRIGHT 2003 ACS

134:266653 Synthesis and properties of poly(amide-imide)s containing a N-methylcarbazole group. Yang, C.-P.; Chen, R.-S.; Chang, C.-C. (Department of Chemical Engineering, Tatung University, Taipei, 104, Taiwan). Colloid and Polymer Science, 278(11), 1043-1051 (English) 2000. CODEN: CPMSB6. ISSN: 0303-402X. Publisher: Springer-Verlag.

AB A new dicarboxylic acid monomer contg. the N-methylcarbazole and imide structures, 3,6-bis(trimellitimido)-N-methylcarbazole (I), was prep'd. from the condensation of 3,6-diamino-N-methylcarbazole (c) and trimellitic anhydride. The diamine c was synthesized in three steps starting from the methylation of carbazole, followed by nitration and catalytic hydrazine redn. A series of N-methylcarbazole-contg. poly(amide-imide)s were synthesized by direct polycondensation from the diimide-diacid I with various arom. diamines. These poly(amide-imide)s had inherent viscosities of 0.66-1.47 dL/g and were readily sol. in a variety of org. solvents, including N-methyl-2-pyrrolidone and N,N-dimethylacetamide (DMAc). Transparent, flexible, and tough films of these polymers could be cast from DMAc solns., and these films exhibited excellent mech. strength. The glass-transition temps. of these poly(amide-imide)s were in the range 317-362.degree.C. All the poly (amide-imide) did not degrade noticeably below 480.degree.C in nitrogen, and the 10% wt. loss temps. and char yields at 800.degree.C were above 520.degree.C and 60% in nitrogen, resp., indicating high thermal stability.

IT 331652-23-4P

(synthesis and properties of poly(amide-imide)s contg. a  
N-methylcarbazole group)

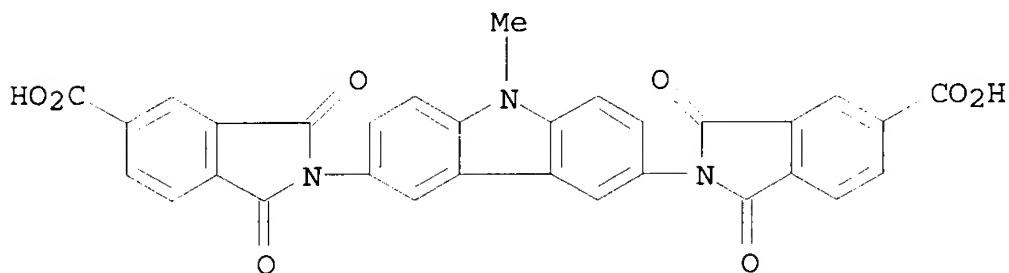
RN 331652-23-4 ZCA

CN 1H-Isoindole-5-carboxylic acid, 2,2'-(9-methyl-9H-carbazole-3,6-diyl)bis[2,3-dihydro-1,3-dioxo-, polymer with 4,4'-[9H-fluoren-9-ylidenebis(4,1-phenyleneoxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 331651-96-8

CMF C31 H17 N3 O8

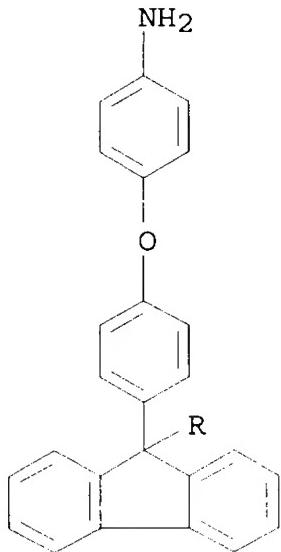


CM 2

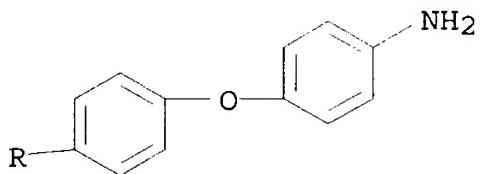
CRN 47823-88-1

CMF C37 H28 N2 O2

PAGE 1-A



PAGE 2-A



IT 331652-23-4P 331652-24-5P

(synthesis and properties of poly(amide-imide)s contg. a N-methylcarbazole group)

L55 ANSWER 5 OF 13 ZCA COPYRIGHT 2003 ACS

133:10742 Electroluminescence and photoluminescence of  
fluorene-carbazole copolymer. Stephan, O.; Vial, J. C. (Laboratoire  
de Spectrometrie Physique, Universite Joseph Fourier Grenoble 1 and  
CNRS (UMR C5588), Saint Martin d'Heres, 38402, Fr.). Materials  
Research Society Symposium Proceedings, 558(Flat-Panel Displays and  
Sensors--Principles, Materials and Processes), 299-304 (English)  
2000. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials  
Research Society.

AB Thin layers of poly(dihexylfluorene-co-N-hexylcarbazole) sandwiched between ITO and Al electrodes show stable photoluminescence and electro-luminescence at room temp. and ambient atm. Current-voltage and Electro-luminescence vs. voltage curves present a much lower threshold than device made up of poly(dihexylfluorene) homopolymer. When using the copolymer, the barrier height for hole injection is reduced to a value close to 0.17 eV to be compared to 0.83 eV for the homopolymer. This difference in offsets was confirmed by electrochem. studies.

IT 250635-55-3  
(electroluminescence and photoluminescence of fluorene-carbazole copolymer with LED, energy transfer, and cyclic voltammetry)

RN 250635-55-3 ZCA

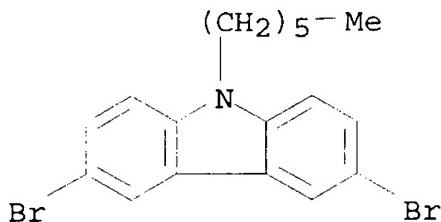
CN 9H-Carbazole, 3,6-dibromo-9-hexyl-, polymer with  
2,7-dibromo-9,9-dihexyl-9H-fluorene (9CI) (CA INDEX NAME)

CM 1

CRN 189367-54-2

CMF C25 H32 Br2

CM 2

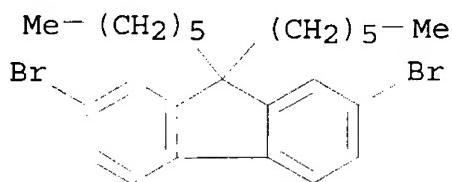
CRN 150623-72-6  
CMF C18 H19 Br2 NIT 250635-55-3  
(electroluminescence and photoluminescence of fluorene-carbazole copolymer with LED, energy transfer, and cyclic voltammetry)L55 ANSWER 6 OF 13 ZCA COPYRIGHT 2003 ACS  
131:351769 Electroluminescence and photoluminescence of fluorene-carbazole copolymer. Stephan, O.; Vial, J. C. (Laboratoire de Spectrometrie Physique, Universite Joseph Fourier Grenoble 1 and CNRS, Saint Martin d'Heres, Fr.). Materials Research Society Symposium Proceedings, 560(Luminescent Materials), 271-276 (English) 1999. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB Poly(dihexylfluorene-N-hexylcarbazole) (poly(DHF-NHK)) was prep'd. by dihalogenative polycondensation of 9,9'-dihexyl-2,7-dibromofluorene and N-hexyl-3,6-dibromocarbazole catalyzed by a Ni(0) complex in N,N-dimethylacrylamide. Thin layers of poly(DHF-NHK) sandwiched between ITO and aluminum electrodes show stable photoluminescence and electro-luminescence at room temp. and ambient atm. Current-voltage and electroluminescence vs. voltage curves show a much lower threshold voltage than that of poly(dihexylfluorene). The barrier height for hole injection of poly(DHF-NHK) is lower, close to 0.17 eV compared to 0.83 eV for the homopolymer; thus, incorporation of the carbazole deriv. was successful in decreasing the barrier height for hole injection.

IT 250635-55-3P, 9,9-Dihexyl-2,7-dibromofluorene-N-hexyl-3,6-dibromocarbazole copolymer  
(lowering hole injection barrier height of polyfluorene by copolymer. of dihexylfluorene with hexylcarbazole)RN 250635-55-3 ZCA  
CN 9H-Carbazole, 3,6-dibromo-9-hexyl-, polymer with 2,7-dibromo-9,9-dihexyl-9H-fluorene (9CI) (CA INDEX NAME)

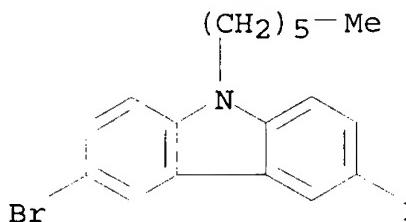
CM 1

CRN 189367-54-2  
CMF C25 H32 Br2



CM 2

CRN 150623-72-6  
CMF C18 H19 Br2 N



IT 250635-55-3P, 9,9-Dihexyl-2,7-dibromofluorene-N-hexyl-3,6-dibromocarbazole copolymer  
(lowering hole injection barrier height of polyfluorene by copolymer of dihexylfluorene with hexylcarbazole)

L55 ANSWER 7 OF 13 ZCA COPYRIGHT 2003 ACS

127:331083 Characterization and properties of the charge transfer complex of carbazole derivatives. Rocquin, Olivier; Chevrot, Claude (Universite de Cergy Pontoise, Laboratoire de Recherche sur les Polymeres et les Materiaux Electroactifs, ESCOM, 13 boulevard de l'Hautil, 95092, Cergy Pontoise, Fr.). Synthetic Metals, 89(2), 119-123 (English) 1997. CODEN: SYMEDZ. ISSN: 0379-6779.

Publisher: Elsevier.  
AB The purpose of this work is to characterize the charge transfer complex (CTC) formed between one carbazolic deriv. and an org. electron acceptor, and to compare some physicochem. properties. We have used either poly(N-vinylcarbazole) or poly(N-butylcarbazole) or again 3,3'-diethyl-9,9'-dicarbazole (DEC) as a donor, and one of the following as acceptor: tetracyanoethylene (TCNE), 2,4,7-trinitro-9-fluorenone (TNF), 1,4-naphthoquinone (NQ) or 2,3-dicyano-1,4-naphthoquinone (DCNQ). The characterization of the CTC has been made following two methods: optical spectroscopy or differential scanning calorimetry (DSC). In fact, when the optical absorption of the CTC corresponds to a well-defined peak, its characterization by optical spectroscopy leads to the detn. of some intrinsic properties such as equil. const., molar extinction coeff., etc. On the contrary, if the optical absorption is indiscernible of the absorption peaks of acceptor or donor alone, we have shown that use of DSC allows us to characterize the formation of CTC measuring

the fusion enthalpy of the CTC. These detns. are only described, in this paper, in the case of the dimer DEC as a donor which possesses a well-defined m.p. The CTC between DEC and each acceptor has been characterized in this way.

IT 198063-18-2

(characterization and properties of charge transfer complex of carbazole derivs.)

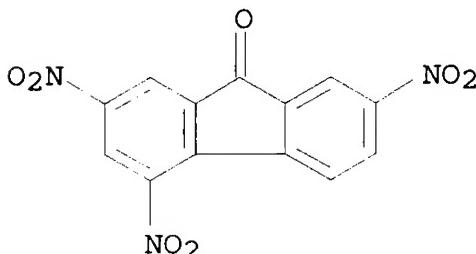
RN 198063-18-2 ZCA

CN 9H-Fluoren-9-one, 2,4,7-trinitro-, compd. with 9-butyl-9H-carbazole homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 129-79-3

CMF C13 H5 N3 O7



CM 2

CRN 153003-55-5

CMF (C<sub>16</sub> H<sub>17</sub> N)x

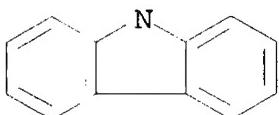
CCI PMS

CM 3

CRN 1484-08-8

CMF C<sub>16</sub> H<sub>17</sub> N

n-Bu



IT 198063-18-2

(characterization and properties of charge transfer complex of carbazole derivs.)

L55 ANSWER 8 OF 13 ZCA COPYRIGHT 2003 ACS

126:172205 An alternating copolymer for a blue light-emitting diode.

Kim, J. K.; Hong, S. I.; Cho, H. N.; Kim, D. Y.; Kim, C. Y. (Polymer Materials Laboratory, Korea Institute Science Technology, Seoul, 130-650, S. Korea). Polymer Bulletin (Berlin), 38(2), 169-176 (English) 1997. CODEN: POBUDR. ISSN: 0170-0839. Publisher: Springer.

**AB** An alternating copolymer composed of 9,9'-dihexylfluorene and N-(2-ethylhexyl)carbazole was synthesized to use as an emissive polymer in a light-emitting diode (LED). The copolymer is sol. in org. solvents and spin-cast to make a fine film. An LED fabricated by sandwiching the alternating copolymer between indium-tin oxide and Al emits a white color with the full width at half max. of 150 nm. The electroluminescence spectrum becomes simplified to have an emission peak at 460 nm for fine blue color when the copolymer is blended with poly(vinylcarbazole) with a ratio of 1 to 4 before the use as an emissive layer. The forward bias turn-on voltage for the LED is 13, and quantum efficiency is 0.002%.

**IT** 187148-78-3

(poly(vinylcarbazole) blends; prepn. and properties of alternating fluorene-carbazole copolymer for blue LED)

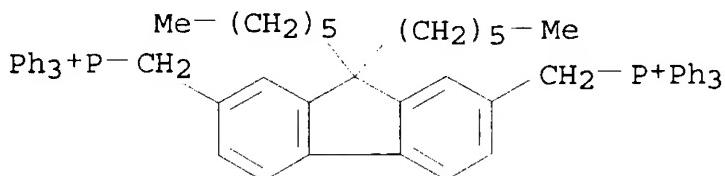
**RN** 187148-78-3 ZCA

**CN** Phosphonium, [(9,9-dihexyl-9H-fluorene-2,7-diyl)bis(methylene)]bis[triphenyl-, dibromide, polymer with 9-(2-ethylhexyl)-9H-carbazole-3,6-dicarboxaldehyde (9CI) (CA INDEX NAME)

**CM** 1

**CRN** 187148-76-1

**CMF** C63 H66 P2 . 2 Br



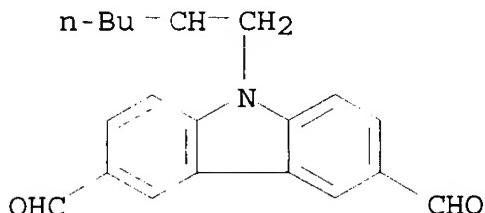
● 2 Br<sup>-</sup>

**CM** 2

**CRN** 169051-20-1

**CMF** C22 H25 N O2

Et



IT 187148-78-3

(poly(vinylcarbazole) blends; prepn. and properties of alternating fluorene-carbazole copolymer for blue LED)

L55 ANSWER 9 OF 13 ZCA COPYRIGHT 2003 ACS

116:204194 Strongly exothermic electron-transfer reaction in the excited singlet state of alkylcarbazole-polynitrofluorene and -polynitrofluorenone bichromophoric systems. 1. Correlation between the probability of charge separation, photoactivity, and picosecond laser photolysis studies on the photoinduced charge recombination of ion pair state produced in some media. Ganguly, Tapan; Sharma, Devendra K.; Gauthier, Sylvain; Gravel, Denis; Durocher, Gilles (Dep. Chim., Univ. Montreal, Montreal, QC, H3C 3J7, Can.). Journal of Physical Chemistry, 96(9), 3757-66 (English) 1992. CODEN: JPCHAX. ISSN: 0022-3654.

AB The parameters were analyzed controlling the rates of forward and backward electron-transfer reactions in strongly exothermic bichromophoric systems of the alkylcarbazole-polynitrofluorene, and alkylcarbazole-polynitrofluorenone types. Electronic absorption spectra of these bichromophoric systems in acetonitrile show charge-transfer bands from which the electronic matrix elements for electron-transfer is evaluated (.apprx.40 meV). From the redox properties of the donor-solvent-acceptor couples the rates for charge sepn. (CS) is calcd. using the semi-quantum-mech. theory applied to these nonadiabatic electron-transfer reactions. The time consts. (.tau.CS) of the photoinduced CS of these systems vary from 200 fs to .apprx.20 ps. These rates are compared to those obtained by the time-resolved absorption spectra of contact ion pairs (CIP) with picosecond laser spectroscopy. The xerog. activity is also measured for the bichromophore in polymeric Lexan matrixes and for polysebacate and polysuccinate oligomers contg. these bichromophores as pendant groups. The square of the rate const. for charge sepn. (kCS2) correlates well with the xerog. gains measured in photoactivity expts. More detailed measurements of the photoinduced charge recombination of the ion pairs formed by irradn. of these systems with the third harmonic of the YAG laser at 355 nm show that the first-order rate consts. for the subsequent relaxation (kd) of these contact ion pairs (CIP) to the solvent-sepd. ion pairs (SSIP) and for the charge recombination (kCR) to the original ground state of these systems are about of the same order of magnitude

(.apprx.108 s-1) and are nearly solvent independent.

IT 129073-21-8

(photoinduced electron-transfer reaction and electrophotog. properties of, picosecond laser photolysis study on charge recombination of ion pair state produced in)

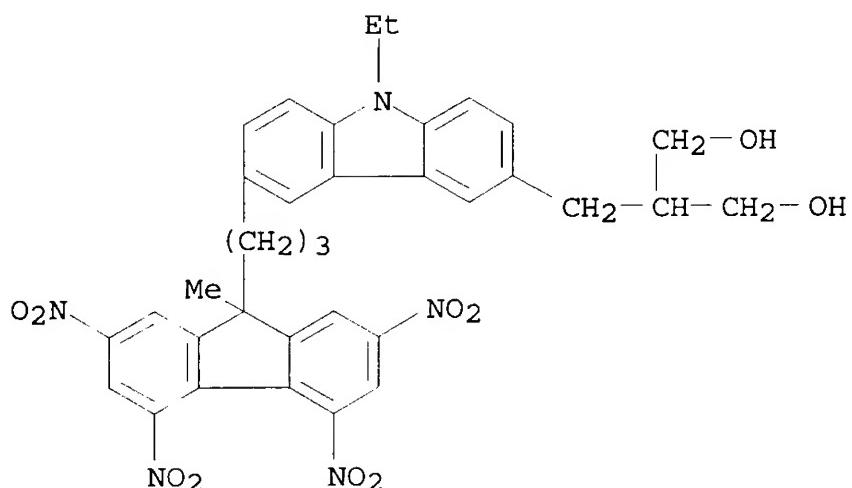
RN 129073-21-8 ZCA

CN Decanedioic acid, polymer with 2-[[9-ethyl-6-[3-(9-methyl-2,4,5,7-tetranitro-9H-fluoren-9-yl)propyl]-9H-carbazol-3-yl]methyl]-1,3-propanediol (9CI) (CA INDEX NAME)

CM 1

CRN 129073-20-7

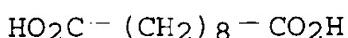
CMF C35 H33 N5 O10



CM 2

CRN 111-20-6

CMF C10 H18 O4



IT 129073-21-8

(photoinduced electron-transfer reaction and electrophotog. properties of, picosecond laser photolysis study on charge recombination of ion pair state produced in)

L55 ANSWER 10 OF 13 ZCA COPYRIGHT 2003 ACS

113:123603 Photophysics of photoconducting polymers with pendant bichromophores II: electron and energy transfer photoprocesses in several carbazole-fluorene donor-acceptor bichromophoric systems based on the monomeric reference compounds. Zelent, B.; Messier, P.; Gauthier, S.; Gravel, D.; Durocher, G. (Dep. Chim., Univ.

Montreal, Montreal, QC, H3C 3J7, Can.). Journal of Photochemistry and Photobiology, A: Chemistry, 52(1), 165-78 (English) 1990.  
CODEN: JPPCEJ. ISSN: 1010-6030.

AB The intramol. electron and energy transfer photoprocesses of several bichromophoric mols. contg. the carbazolyl chromophore as electron donor and the polynitrofluorene or 9-dicyanomethylene fluorene chromophore as electron acceptor were studied by measurement of the luminescence spectra and electrochem. properties of the corresponding monochromophoric ref. compds. For all donor-acceptor systems considered, the Rehm-Weller free energy is neg. (.DELTA.GET < 0) and for the long-range dipole-dipole interactions between the chromophores, the Foerster crit. transfer distance R0 .apprxeq. 30 .ANG. at 296 K. These values of .DELTA.GET and R0 correspond to rate consts. kq and kFT of the same order of magnitude (i.e. approx. 10<sup>11</sup>-10<sup>13</sup> s<sup>-1</sup>) in accordance with the strong fluorescence quenching of the carbazolyl chromophore found in all of the bichromophoric mol. systems studied.

IT 129073-21-8

(intramol. electron and energy transfer photoprocesses of)

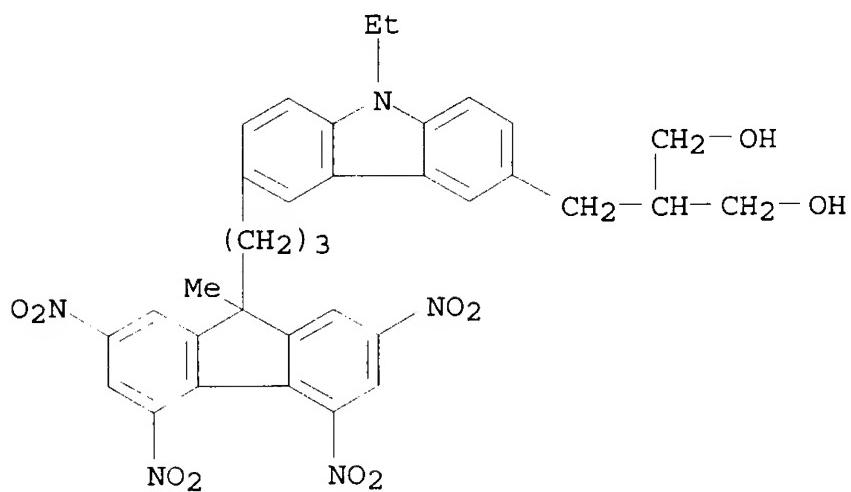
RN 129073-21-8 ZCA

CN Decanedioic acid, polymer with 2-[[9-ethyl-6-[3-(9-methyl-2,4,5,7-tetranitro-9H-fluoren-9-yl)propyl]-9H-carbazol-3-yl]methyl]-1,3-propanediol (9CI) (CA INDEX NAME)

CM 1

CRN 129073-20-7

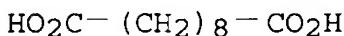
CMF C35 H33 N5 O10



CM 2

CRN 111-20-6

CMF C10 H18 O4



IT 129073-21-8

(intramol. electron and energy transfer photoprocesses of)

L55 ANSWER 11 OF 13 ZCA COPYRIGHT 2003 ACS

109:138931 Migration mechanism of the Onsager's charge-carrier photogeneration. Aleksandrova, E. L.; Cherkasov, Yu. A. (USSR). Optika i Spektroskopiya, 64(5), 1047-55 (Russian) 1988. CODEN: OPSPAM. ISSN: 0030-4034.

AB A dependence of quantum yields of charge carrier photogeneration on the spatial and energetic parameters of the polymeric donor-acceptor complexes was established for the series of poly(vinylcarbazole) and its analogs (9-substituted polymeric carbazoles, and vinyl arom. polymers) with the acceptors chosen from fluorene derivs., intramol. complexes, and tri-component dye complexes. The migration mechanism of the Onsager photogeneration for the the donor-acceptor complexes was developed, based on the intramol. migration of the bound charge. A good agreement between theor. calcd. and exptl. dependencies was obtained. The possibility of increasing photosensitivity of the electrophotog. and photothermoplastic materials choosing the proper structure of the complex is indicated.

IT 116559-55-8P

(photogeneration of charge carriers in, Onsager, migration mechanism of)

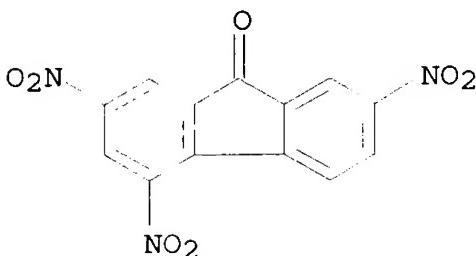
RN 116559-55-8 ZCA

CN 9H-Fluoren-9-one, 2,4,7-trinitro-, compd. with 9-(pentenyl)-9H-carbazole homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 129-79-3

CMF C13 H5 N3 O7



CM 2

CRN 116559-54-7

CMF (C17 H17 N)x

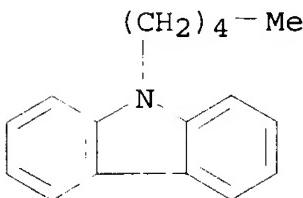
CCI PMS

CM 3

CRN 96018-53-0  
 CMF C17 H17 N  
 CCI IDS

CM 4

CRN 1484-07-7  
 CMF C17 H19 N



IT 116559-55-8P 116559-56-9P

(photogeneration of charge carriers in, Onsager, migration mechanism of)

L55 ANSWER 12 OF 13 ZCA COPYRIGHT 2003 ACS

107:199005 Synthesis and charge-transfer complexes of dinitrofluorenone-containing polyesters. Pashkin, I. I.; Tverskoi, V. A.; Andrievskii, A. M.; Pravednikov, A. N. (Mosk. Inst. Tonkoi Khim. Tekhnol., Moscow, USSR). Vysokomolekulyarnye Soedineniya, Seriya A, 29(8), 1744-8 (Russian) 1987. CODEN: VYSAAF. ISSN: 0507-5475.

AB Polycondensation of di-Cs 4,5-dinitrofluorenone-2,7-dicarboxylate (I) with .alpha.,.omega.-dibromoalkanes or p-xylylene dibromide gave electron-acceptor polyesters, the properties of which depended on the length of the hydrocarbylene sepg. the I acceptor units. I polyesters formed 1:1 charge-transfer complexes with N-ethylcarbazole, poly(N-vinylcarbazole), and poly(N-glycidylcarbazole). The stability of the complexes was little dependent on the length of the hydrocarbylene chain between I units.

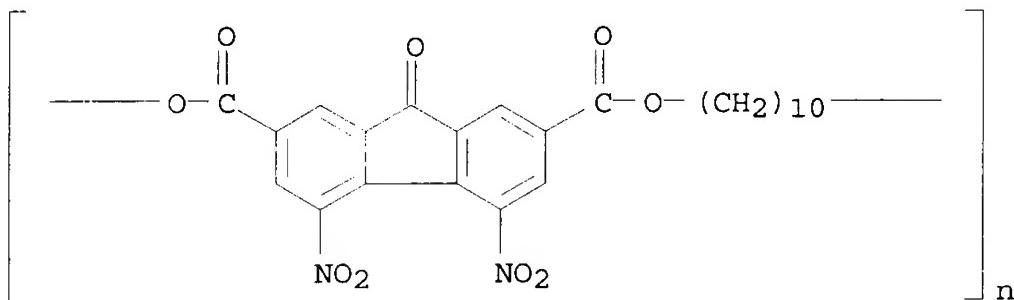
IT 111135-92-3P  
 (formation and stability const. of)

RN 111135-92-3 ZCA

CN 9H-Carbazole, 9-ethyl-, compd. with poly[oxycarbonyl(4,5-dinitro-9-oxo-9H-fluorene-2,7-diyl)carbonyloxy-1,10-decanediyl] (9CI) (CA INDEX NAME)

CM 1

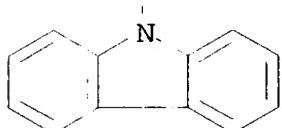
CRN 111135-90-1  
 CMF (C<sub>25</sub> H<sub>24</sub> N<sub>2</sub> O<sub>9</sub>)<sub>n</sub>  
 CCI PMS



CM 2

CRN 86-28-2  
CMF C<sub>14</sub> H<sub>13</sub> N

Et

IT 111135-92-3P 111135-93-4P 111158-72-6P  
111159-07-0P 111159-10-5P 111159-11-6P  
(formation and stability const. of)

L55 ANSWER 13 OF 13 ZCA COPYRIGHT 2003 ACS

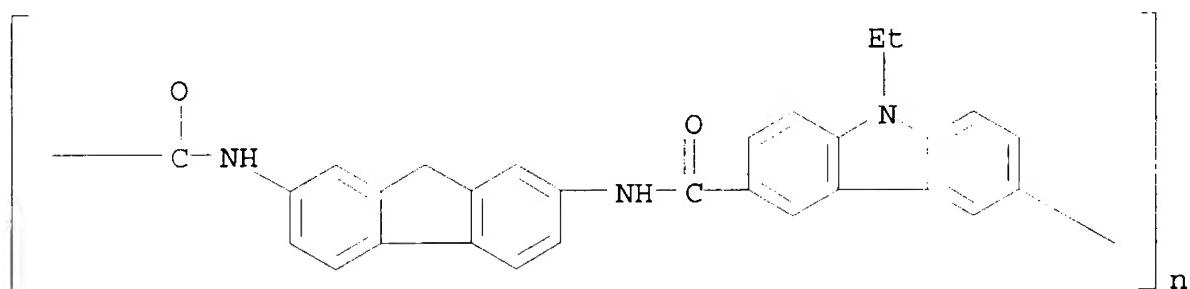
87:53801 Synthesis and evaluation of the heat resistance of aromatic polyamides from N-ethylcarbazole-3,6-dicarboxylic acid. Negodyaev, N. D.; Netunaeva, V. V. (Ural. Politekh. Inst. im. Kirova, Sverdlovsk, USSR). Deposited Doc., VINITI 2004-75, 6 pp. Avail. BLD (Russian) 1975.

AB The title polyamides were prep'd. in 75-90% yields by condensation of N-ethylcarbazole-3,6-dicarbonyl chloride with arom. diamines. The thermal stability of the polyamides, depending on the structure of the diamine unit, increased in the order: 4,4'-diaminodiphenylmethane and 2,7-diaminofluorene &lt; p-phenylenediamine &lt; benzidine &lt; m-phenylenediamine. The thermal stability was detd. as the temp. at 10% wt. loss on heating in air and the wt. loss on heating at 600.degree..

IT 63622-96-8P  
(prepn. and thermal stability of)

RN 63622-96-8 ZCA

CN Poly[(9-ethyl-9H-carbazole-3,6-diyl)carbonylimino-9H-fluorene-2,7-diyliminocarbonyl] (9CI) (CA INDEX NAME)



IT 63622-96-8P 63623-11-0P  
(prepn. and thermal stability of)